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See You in NEW ORLEANS, LA.

Alfred F. Theard,
General Superintendent,
Sewerage and Water Board

From a small struggling French settlement founded by Bienville in 1718, New Orleans has grown to the metropolis of the South with half a million people. Its old traditions have been kept alive and its historic treasuries and distinctive customs of early life preserved.

New Orleans basks happily and securely in a mild semi-tropical sun, behind the impenetrable levees of the mighty Mississippi River, 107 miles from the Gulf of Mexico. The Heart of the old city is the Vieux Carre where will be found beauty, history and romance.

Modern New Orleans is equally fascinating with 171-foot wide Canal Street as the dividing line. An industrial city of the first magnitude, the leading wholesale and retail market of the South, its greatest financial center and port city, New Orleans sets the pace for Southern progress. Three thousand ocean-going vessels clear from here each year, while barge lines plying up and down the Mississippi and its tributaries and the Intracoastal Canal use New Orleans' eight miles of wharves as their terminus.

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Responsibility for Relief—Four Points of View

U. S. Conference of Mayors

FROM a statement, dated March 21, by Paul V. Betters, Executive Director, United States Conference of Mayors, based on a previous statement by Mayor Neville Miller, of Louisville, as representing the viewpoint of the chief executives of the major American cities:

"Among the municipal executives there is no issue as to work versus direct relief either in kind or in cash for those able to work. I believe that the people of this country are satisfied that the preferable form and the American way is that of work.

"Since the vast numbers of able-bodied unemployed have been thrown on relief through no fault of their own but by reason of a national economic condition, logical grounds, primarily on the financial side, were presented as early as September, 1934, for placing on the Federal Government complete responsibility for taking care of this group. At the same time recommendations were made that care of the unemployables should be the responsibility of the state and local governments. It is well known that any formula for division of responsibility is open to criticism, and we all know that serious questions have been raised by many as to any categorical division of the relief rolls into two groups—employables and unemployables.

"The history of the Federal work program shows that the WPA and other affiliated Federal agencies have given work to the large bulk of the destitute unemployed. Second, the program has, in general, been administered effectively and fairly. Third, the projects completed and now under way represent, in the main, useful and needed work.

"On the other side, the chief criticism comes from the fact that the Federal Government has hedged on its portion of the job on two fronts: first, it has not taken care of all the employables, and second, it has not assumed complete financial responsibility for the Federal work program since sponsors are required to make substantial local contributions. These two criticisms are justified, and in so far as these portions of the Government's task are not being met, the formula has broken down. However, the restricted funds made available to the WPA are solely responsible for this condition.

"It is my opinion that adequate resources are available to the state governments, which, if added to local contributions, will be sufficient to provide adequately for the direct relief needs of the country. This is assuming, of course, that the Federal Government will provide work for the bulk of the relief population able to participate in a work program."

Community Mobilization for Human Needs

AT the National Citizens Conference, held in Washington, D. C., March 11-12, by the Community Mobilization for Human Needs, the following proposals were endorsed:

1. *Federal Appropriations.*—The Federal Government should appropriate to the states a sum of money according to a stipulated formula to carry out a *general relief program, including work relief.* The amount appropriated by the Federal Government should be a definite sum available only upon condition that it be matched by the states in prescribed proportions; *each state to apportion to local communities upon any basis it may decide compatible with relief needs;* and the determination of the amount and character of work relief and of those eligible for relief to be primarily the responsibility of the state and local community. This recommendation is not to be taken as opposing a Federal program for public works on a non-relief basis.

Transients.—The Federal Government should make special grants to states from the general relief fund, so that care may be given to interstate transients.

2. *Standards.*—The Federal Government should set up standards of administration and of relief within general limits. These standards should require within each state and city a unified or at least a coordinated administration, under an adequate and inclusive merit system of appointment, of all public assistance and general relief programs to which the Federal Government contributes funds. Such a unification can be realized only gradually, especially during the present emergency.

3. *National Commission.*—The human values and the expense involved in relief, security, and public welfare programs, and the current confusion in the public mind about them, urgently require a careful and unbiased investigation and review by a national commission appointed by the President with the approval of the Senate. This commission should work in conjunction with the present committee of Congress. Since many of the welfare activities are permanent but require constant revision, a commission of this kind could be of great assistance in drafting a long-term program for the consideration of the Legislature and the President.

Governmental Research Association

RECOGNITION of relief as a permanent problem, and abandonment of "hand-to-mouth" policies, were urged on March 18 before the U. S. Senate Special Committee to Investigate Unemployment and Relief, by Carl P. Herbert, Director of the St. Paul Bureau of Municipal Research. Speaking on behalf of the executive directors of eighteen member agencies of the Governmental Research Association, Mr. Herbert presented the considered opinion of this group that:

1. In the future over a long period of years the cities in particular must anticipate expenditures for relief on an enlarged basis not comparable with that existing prior to the depression.

2. On the basis of analyses of past and existing relief costs for a number of typical cities, it must be concluded that the cities cannot assume this present level of costs either for direct relief or work relief or a combination of these.

3. In a similar way it would be impractical for the state to meet the present level of these costs as a continuous operating expense.

4. Therefore, it is believed that the participation of the Federal Government in the relief situation has been necessary to prevent unreasonable hardship and cannot be discontinued immediately.

5. With a view to emphasizing local responsibility for relief, it is urged that allocation of all Federal funds to state and local units be made on a strictly matching basis—the local or state participation to be sufficiently large to provide an emphatic interest in economy.

6. The determination of whether relief be on a direct or work relief basis be left entirely to the state and local government.

7. Federal aid should be granted to states only when the state and local administration is on an efficient basis and the smallest units of administration are the counties, larger cities, or administrative districts of comparable significance.

8. Federal aid should be granted on a sufficiently long-term basis so that local governments can enact complete twelve-month municipal budgets in advance of each fiscal year.

American Association of Social Workers

SHOCKINGLY low standards of care for those in need dependent upon direct relief in many localities is revealed in a survey of the current relief situation compiled by the American Association of Social Workers, released on March 21. Needy families and individuals are receiving totally inadequate relief in many sections, while others, notably aliens and transients, are unable to secure any assistance in other sections, the survey reveals. Mounting social need due to increasing unemployment and inadequate state and local finances were pointed out as contributing factors to the situation.

The report is based on data secured from 43 representative areas in 28 states. Walter West, Executive Secretary of the Social Workers' Association, in releasing the survey for publication, said:

"The facts revealed by this survey are evidence of the need for a re-casting of public thinking on the question of providing for those who through no fault of their own find themselves dependent upon outside assistance for their bare subsistence.

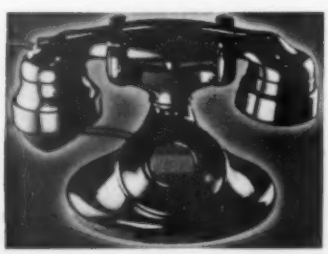
"There can be no doubt but that welfare practices in many areas have deteriorated to pre-depression levels. Insufficient funds available locally in many states have dictated a wholesale reduction of relief grants, the elimination of essential items from relief allowances, and harsh policies governing acceptance of applications designed to make relief hard to get and difficult to endure."

Mr. West also pointed out that the inability of the Federal works program to absorb all employable needy family heads had contributed to local difficulties. He made it clear that the Association was not attacking the WPA program as such, saying:

"Social workers support the ideal of a work program. Our point is that it is not and cannot be a covering program that can ever provide for all of those in need who can work. The works program has absorbed part of the total able-bodied group in need, but it has left another large group dependent upon either inadequate or totally absent state and local facilities in many sections of the country. The only logical and sensible approach to this problem is a system of Federal grants-in-aid to states for direct relief to underpin the Federal works program and to assist state and local governments to finance a decent humane program of general assistance for those who cannot be cared for through a work program."

Sleep SOUNDLY, LITTLE LADY

"Mother and Daddy are near and the telephone is always close by. It doesn't go to sleep. All through the night it stands guard over you and millions of other little girls and boys."



EACH NIGHT about 11,000,000 telephone calls are made over the Bell System. Many are caused by sudden, urgent needs.

Great in its every-day values, the telephone becomes priceless in emergencies. The constant aim of the Bell System is to give you, at all times, the best and the most telephone service at the lowest possible cost.

BELL TELEPHONE SYSTEM

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Our Municipal Notebook

States Own 621 Signals

ALL the 48 states and 48 of the larger cities have reported to this magazine the number of signalized intersections which they own and operate. Of the 621 state-owned and operated installations, 200 are in Michigan, 108 in Maryland, 68 in Rhode Island. In fact, 8 states have 577, or 93 per cent, of them, while 27 states do not own or operate signals.

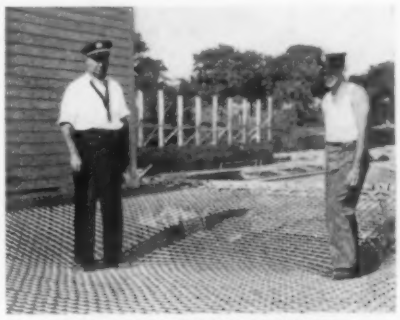
Forty-eight cities of 100,000 population or more, exclusive of New York City, own and operate traffic signals at 8,145 intersections. New York has signals at 7,500 intersections. Next in order are Los Angeles with 774, Philadelphia with 729, and Chicago with 574.

Diesel Buses in Newark

THIS view of Broad and Market Streets, Newark, N. J., is interesting for several reasons. It is one of the busiest intersections in the world. The traffic tower, which will be replaced by four-corner far-right and near-left two-way signals, was a proud utility up to five years ago, not only with a policeman in the bronze compartment directing the surges at this intersection, but with seven intersections on Broad Street and two on Market Street working by the signals of this lone tower. The policeman has now been replaced by a G.E. timer automatically operating the green-amber-red lights on each of the four sides of the tower. Thirty-five Newark intersections have thus been signalized, with 27 more on the program.

Not only are there eight buses in this picture, absorbing as much as possible of Newark's travel; but the two in the foreground are diesel-electric coaches. Public Service Coordinated Transport has pioneered successfully with the first fleet of these, 27 diesel-electrics carrying 28,000 passengers per day on the 10 miles between West Orange and Newark's business district. The diesel principle, the engine design, expert selection of fuel and lubricating oils, combine to produce good service with twice the fuel mileage of a comparable gasoline bus.

Training Nets



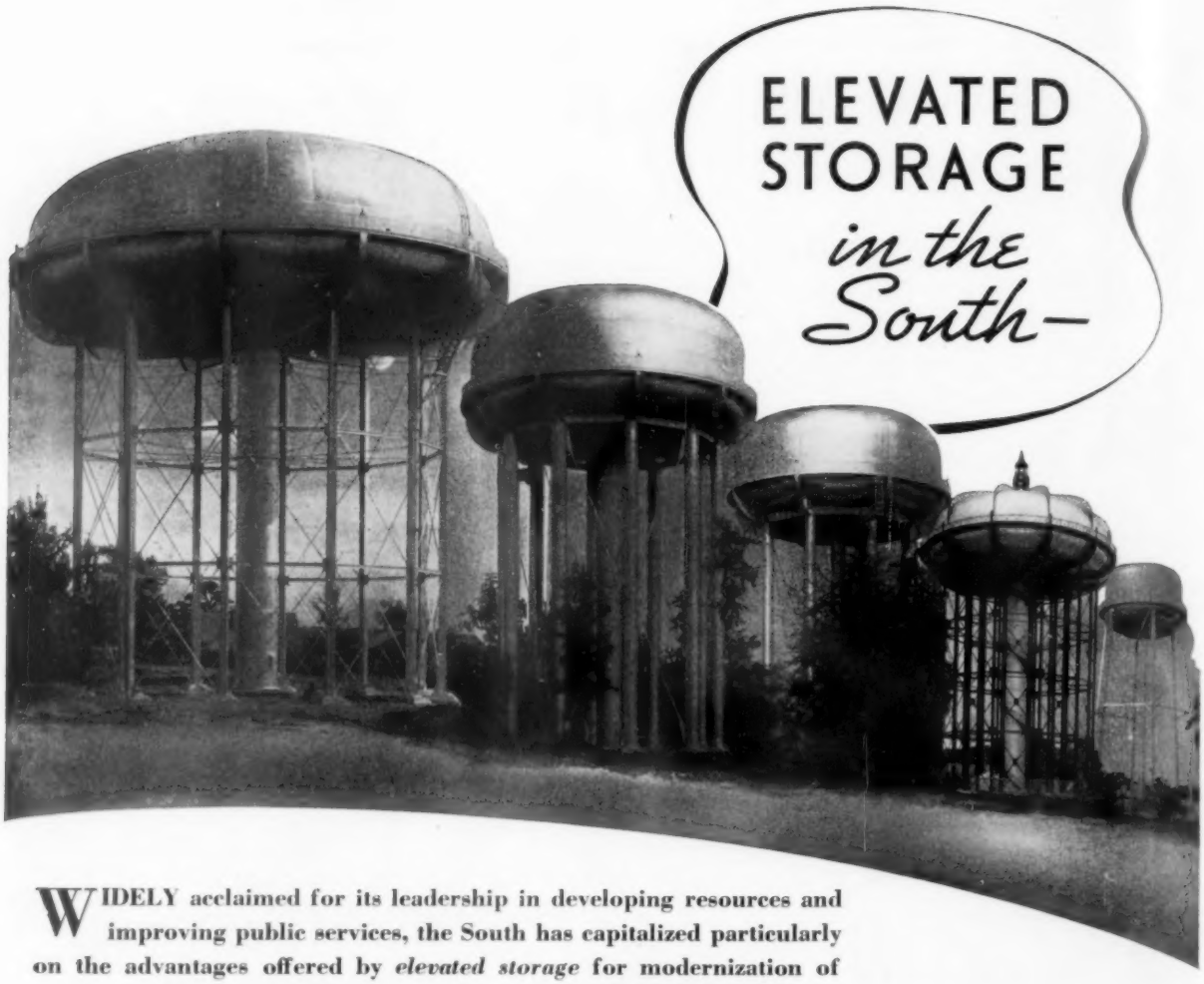
NOTE UNIFORMITY OF STRESS

LIFE-NETS used in fire service are no exception to the rule that every manufactured device is the outcome of much thinking, knowledge and experience. There are two main classes of nets—those used at fires and those used in the training of firemen. The one is universally carried by apparatus as a regular specified item; the other becomes increasingly interesting as more and more departments conduct fireman training, which is likely soon to become compulsory.

Nets are expensive or cheap depending on how much one knows about them. The photograph is of a net made by Deputy Chief James Thompson, Jr., Irvington, N. J., who says that, having it to do again, he would have it made by a manufacturer.

Such a net not only protects the men, but also the city, against damages and loss of time.

ONE OF THE WORLD'S BUSIEST INTERSECTIONS, AT BROAD AND MARKET STREETS, NEWARK, N. J.



WIDELY acclaimed for its leadership in developing resources and improving public services, the South has capitalized particularly on the advantages offered by *elevated storage* for modernization of water supply systems. The composite group of Horton tanks shown above is typical of the numerous installations that have been made recently in the South. Here, as elsewhere, domestic and industrial consumers alike value highly the uniformity and dependability of service made possible by adequate gravity supply.

In many instances, important savings have also been secured. Invariably, engineers find it possible to operate pumps at more efficient rates with elevated storage and where purchased power is used, a large percentage of the pumping can often be scheduled at off-peak periods when power rates are lowest.

Horton Elevated Tanks are offered in a complete range of sizes all designed to combine pleasing appearance with sound engineering practice. For information, please address our nearest office.

READING from upper left to right, the installations shown above are as follows: 1,000,000-gal. radial-cone bottom tank at Montgomery, Alabama; 500,000-gal. Colonial design tank in Decatur, Georgia; 400,000-gal. Colonial design tank in service at Tallahassee, Florida; 1,000,000-gal. radial-cone bottom tank, Rocky Mount, North Carolina; 200,000-gal. ellipsoidal-bottom tank in the Live Oak, Florida water supply system.

•

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Cleveland	2236 Rockefeller Bldg.	Birmingham	1502 N. Fiftieth Street	Tulsa	1625 Hunt Bldg.
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Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

When you write for that catalog, kindly mention THE AMERICAN CITY.

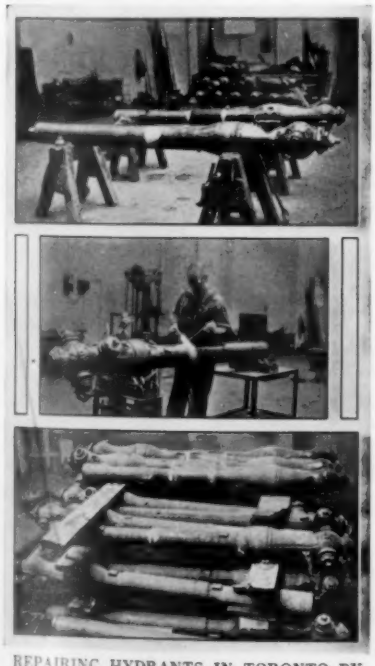
Hints, Helps and News in Water Supply

Fire-Hydrant Repair Cost Cut by Jigs

AN old story to many, but new to others, is the repair of water hydrants by bronze-welding. A new fire hydrant body costs about $57. In years past, a damaged hydrant body was worth about $2.50 as scrap. Today, in Toronto, Canada, the Water Department is reclaiming hydrants for a very small fraction of the cost of a new one. The Water Department has set up two special tables fabricated by welding for this job. The tables are provided with dollies or rollers on which the hydrants can be turned to facilitate welding.

The hydrants are put on the dollies and bronze-welded. In some cases a length of pipe is used as a sleeve and bronze-welded to the remaining part of the hydrant at each end. Occasionally, parts from two or more badly damaged hydrants on which individual repairs are impossible, are combined to make one good hydrant. Bronze-welding is likewise used to lengthen hydrants taken out of service in suburban districts. Many of these were installed before these districts were incorporated in the city of Toronto, and are shorter than standard. Instead of scrapping them, they are lengthened at a small cost and placed in stock for further use as required.

This method of repairing hydrants was developed by George G. Routledge, Superintendent, Water Distribution Section, Department of Works, Toronto. THE AMERICAN CITY is indebted to Linde Air Products Co. for the illustrations.



REPAIRING HYDRANTS IN TORONTO BY BRONZE WELDING

Top—Old method of setting up hydrants for welding. Center—New method, with welded tables and dollies. Bottom—Damaged hydrants reclaimed by welding

Meter Readers Wear Uniforms

TO assist Los Angeles citizens in identifying persons entering their premises, meter readers of the Los Angeles Department of Water and Power, beginning last November 15, have been dressed in uniforms of olive green, with a department seal in color on the left arm and a department badge on the front of the visor cap. This is a great protection to all householders as well as to the meter readers themselves in establishing their identity.

Hitherto, the 109 men who read the city's electric and water meters have worn conventional clothing in making their daily rounds. Since their work requires them to go into yards and into buildings where meters are located, their presence sometimes has been questioned until they produced satisfactory identification Adoption of the uniforms removes this uncertainty and is in the public's interest.

The uniforms consist of trousers with bright blue stripe, blouse type jacket on which the vari-colored seal is sewed, and an officer's type cap with black visor. Gray shirt and black tie complete the outfit. The uniforms were made locally.

In the course of a single month Department of Water and Power meter readers in Los Angeles take the readings of half a million meters. Records show that the percentage of errors is less than 0.1 per cent and continuous efforts are made to lower this minute fraction. The Department urges consumers to assist in this program, which is of benefit to them, by keeping meters free from obstructions and by making it possible for readers to reach the meters quickly on the regular monthly date shown on consumers' bills.

The illustration of the meter reader's uniform is by the courtesy of the Department of Water and Power, Los Angeles.

The Self-Purification of Streams and Lakes

WHEREVER water is found on the earth's surface, it submerges the lowest of the surrounding lands, forming brooks, rivers, ponds, and lakes which are the natural drains of all the lands sloping to them. Within such water there is a continual battle for existence between countless hosts of animal and vegetable life. If conditions are such as to maintain the delicate balance between the various forms of life, the water is relatively pure and these life-cycles are responsible for what is often referred to as self-purification of water in streams and lakes. A river polluted with sewage may be seen to improve in quality progressively downstream, but there is no insurance, as often erroneously stated, that pathogenic bacteria have been removed.

—By MALCOLM PIRNIE, consulting engineer, New York City, in the National Resources Committee report on "Technological Trends and National Policy."

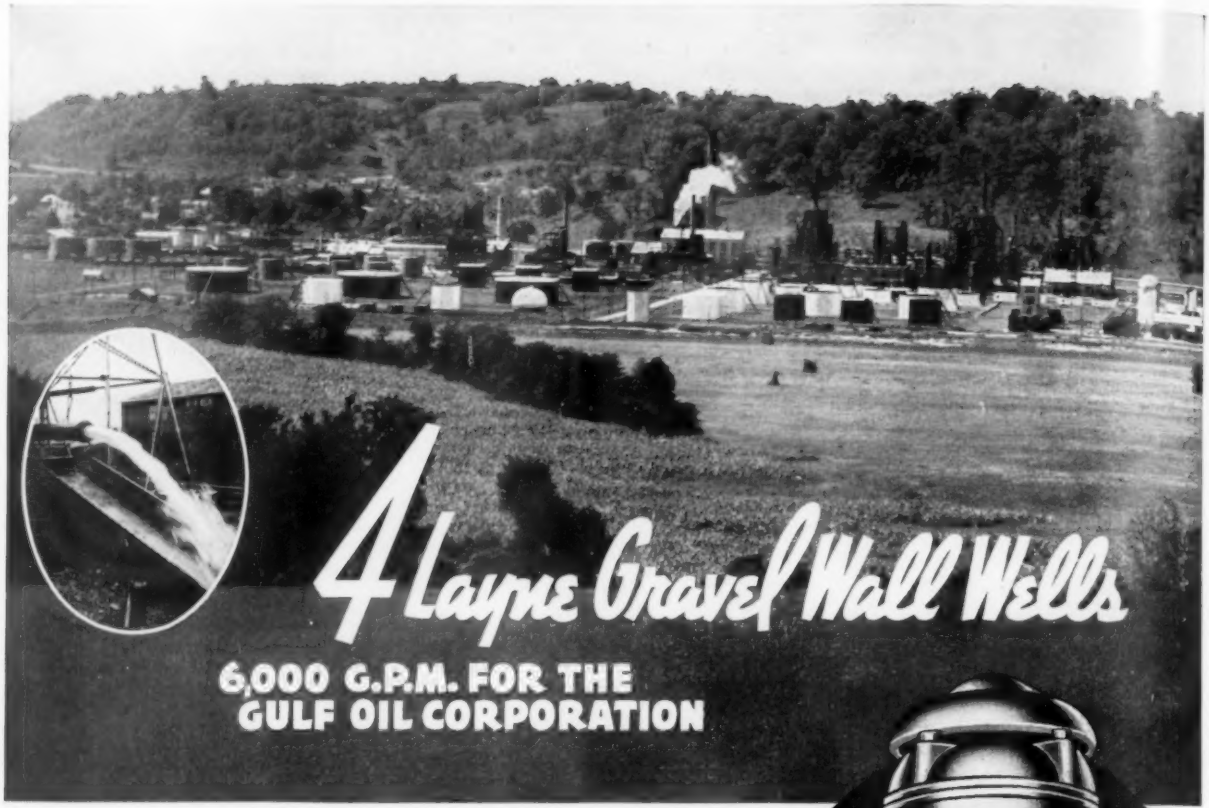
THE METER READERS OF THE LOS ANGELES DEPARTMENT OF WATER AND POWER ARE PROMPTLY ADMITTED, SINCE THE NEW UNIFORMS QUICKLY IDENTIFY THEM

100 Per Cent Metering Means Savings in Otego, N. Y.

IN the summer of 1934, because the spring water supply for Otego, N. Y., could not keep pace with the increasing demand, a series of wells were started to overcome the possibility of any shortage. At the same time a universal metering program was launched, with Pittsburgh meters on all services. Charging for water, based on actual meter readings, did not begin until November 1, 1934.

The power bill for pumping during the period of eight months, from March 1 to November 1, 1934, when the meters were not in use, amounted to $446.46. For the remainder of the fiscal year, November 1, 1934, to March 1, 1935, the power bill was only $40.75, an appreciable saving.

Proof that a 100 per cent metered system is the most economical is best evidenced by the fact that for the fiscal year from March 1, 1935, to March 1, 1936, the power bill was reduced to $160.01, and for the following year, with increased consumption, the bill was only $246.83. About $100 a year in excess charges is collected for water used in excess of the allowance of 40,000 gallons a year, which properly could be considered as an offset on the power bill.

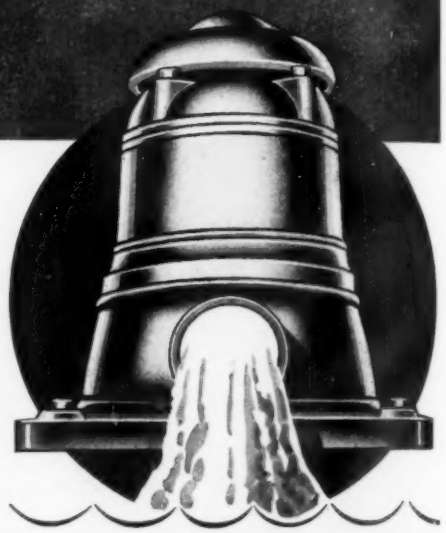


4 Layne Gravel Wall Wells

6,000 G.P.M. FOR THE GULF OIL CORPORATION

Taking the place of old style, inefficient tubular wells, four new Layne Gravel Wall Wells now give the Cleves, Ohio Gulf Refining Co. plant 6,000 gallons of cool, clear water every minute. These wells have 26 inch diameter by 25 foot Everdur bronze strainer points. Equipped with 75 horse power, outdoor type, weather-proof motors (no pump houses necessary), these Layne designed, drilled and equipped wells and pumps are setting splendid records of high efficiency and economical operating cost.

Layne Well Water Systems are designed to fit the individual needs of each purchaser. They embody many exclusive, Layne created and proven construction features. Their low upkeep cost saves many dollars of useless expense. Interesting facts about producing water at low cost may be obtained by addressing LAYNE & BOWLER, Inc., Dept. B, Memphis, Tenn.



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LAYNE

PUMPS & WELL WATER SYSTEMS

FOR MUNICIPALITIES • INDUSTRIES • RAILROADS • MINES AND IRRIGATION

Municipal Engineering

THREE INTERNATIONAL TRACTORS OWNED BY THE CITY OF BINGHAMTON, N. Y., AND USED FOR SNOW REMOVAL

Street Cleaning in Sydney, Australia

WITH 136 miles of paved streets, the City Cleaning Department of Sydney, Australia, each year removes a total of approximately 6,500 tons of refuse, creating employment for nearly 400 men. According to a short item in *The Street Cleaner*, the last ten years have seen a steady decrease in the amount of litter removed from the streets of Sydney. Where about 6,500 tons are removed annually now, the amount ten years ago was placed at 23,000 tons. The decline is attributed to the increasing civic sense and cleanliness of citizens, the passing of the horse, and to better street services.

Every street in the city is cleaned daily, while those in the heart of the city receive many cleanings during the course of 24 hours. As in most cities, a large amount of street cleaning is done under cover of night without fuss or publicity. At 11:30 each night a force of 36 men, with flushers and motor sweepers, start their rounds, which last until 6:00 the next morning. In addition, on Saturday afternoons the same job is done between the hours of 12:15 and 5:15. With a holiday approaching, an extra crew of 66 men sets out to give the city an additional cleaning. While early workers as they step out of their homes in the morning are always greeted by clean streets, by 9:00 o'clock litter is present in noticeable amounts, and the force is on the job again with plenty of work facing them.

Among the rubbish collected, a queer assortment of things is found. Each day, about 20 dead cats and dogs, slain by motors, are carried away. Recently, an unsolved mystery was presented by the presence of two fat packages of service rifle ammunition, saved from the bin at King's Cross. Again, an important link in a baffling murder case was discovered when a knife badly wanted by the police was found. Many a citizen is grateful to the Street Cleaning Department for locating false teeth, wedding rings, keys and jewelry lost.

The Department, proud of its efficiency, asks nothing from citizens but their cooperation. To make this cooperation simple and easy, 450 waste baskets are placed at strategic points throughout the city to receive paper and other litter which would otherwise be dropped on the streets.

Paving in Berlin

ACCORDING to a recent report from the Bureau of Foreign and Domestic Commerce, there are 33,488,000 square yards of paved streets in Berlin, Germany. Of this total, 9,568,000 square yards are asphalt, which is 75 per cent of all the asphalt paving in Germany. Paving stones, large and small, account for 17,940,000 square yards, and the balance, 5,980,000 square yards, are of tar, concrete or wood block construction. There is in addition 27,508,000 square yards of stone-paved sidewalks.

The average cost of construction per square yard is $3.33 for street paving, and $5.54 per square yard for sidewalks. In 1936 street maintenance cost $1,400,000, and new construction, including reconstruction, $2,400,000.

Johannesburg Streets

WITH the phenomenal development of Johannesburg, Union of South Africa, during 1937 and the building of new suburbs, the city's road-making program is to be increased, according to a report from the office of the American Commercial Attaché in Johannesburg. Fifty miles of new roads are to be constructed and macadamized during 1938. The Works Committee has allocated a total of $693,000 to be spent on new roads, and an average of about $14,850 per mile.

Jetties at Sheboygan

IN the March, 1938, issue of THE AMERICAN CITY, page 61, appeared an article on the building of the new jetties at Sheboygan, Wis. There has just come to us cost data on the building of these jetties which is of genuine interest to our readers. The work was started on June 16, 1937, mixing and pouring of concrete started on July 21, block setting started on September 1, mixing and pouring concrete was completed October 21, and the setting of the blocks in the permeable jetties was completed November 22, 1937.

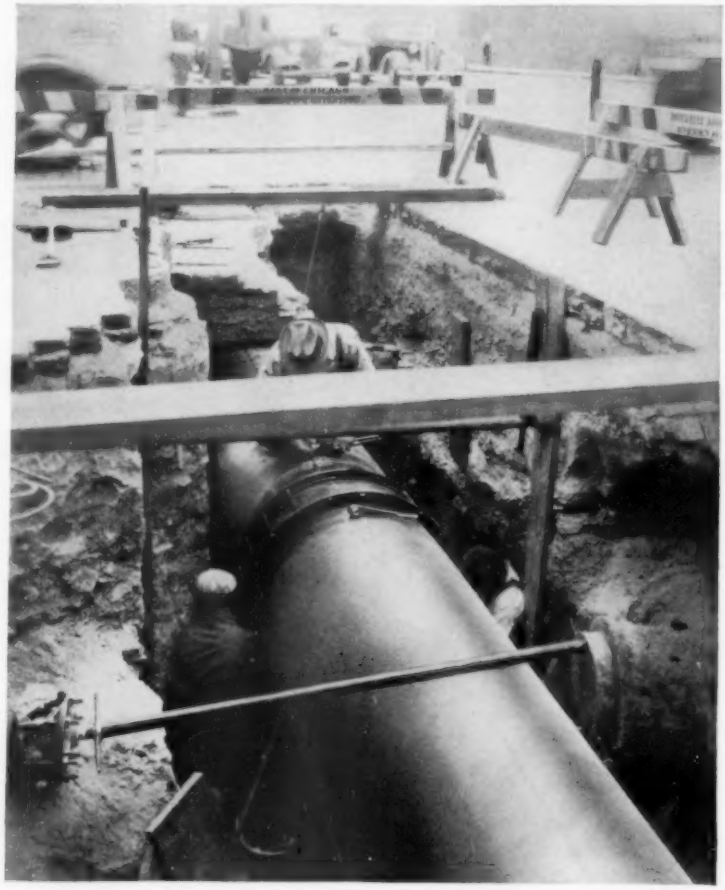
A total of 837 blocks were built. This required 29,018 cubic feet of concrete, or 1,074 cubic yards. A total of 798 blocks was set in 4 groins, having a total length of 641 linear feet. The average cost per block in place was $37.25. The average cost per foot of jetties was $48.80.

ALLOTMENT OF FUNDS, APPROVED MAY 27, 1937

ALLOTMENT OF FUNDS, APPROVED MAY 27, 1937				
Federal funds	Labor		$26,880 00	
	Other		3,500 00	$30,380 00
Sponsor's pledge	Labor		1,650 00	
	Other		16,294 00	17,944 00
(Includes tail-wall costs)	Total			$58,324 00
PROJECT COST, EXCLUDING WALL CONNECTING THE FERVEABLE GROINS AND THE SHORE, AND THE FILLING AT THE SHORE END, WITH PROJECT STILL INCOMPLETE				
Federal funds				
	Skilled labor	4,802 man-hours	4,347 06	
	Unskilled labor	10,513 man-hours	6,140 45	
	Other labor		1,043 43	11,530 94
	Other costs, 1,400 bbls. cement			3,077 97
	Total Federal costs			14,608 91
Sponsor's contribution				
	Skilled labor	3,147½ man-hours	2,476 93	
	Semi-skilled labor	1,240 man-hours	818 40	
	Unskilled labor	127 man-hours	76 20	
	Engineering, drafting, clerical		734 00	
	Compensation insurance		396 71	4,502 24
Other costs				
	Shelter house, rental		28 50	
	Truck rental		622 50	
	Crane rental		2,112 00	
	Tractor rental		1,399 38	
	Mixer rental		478 13	
	Vibrator rental		422 00	
	Lumber		1,281 65	
	Reinforcing		1,178 88	
	Metal mat. for forms		790 33	
	Bar supports		307 20	
	Nails, bolts, wedges and hardware		174 12	
	Sand, 748 tons		638 46	
	Stone, 1,395 tons		1,470 86	
	Miscellaneous		321 66	
	Sidney M. Wood, patent rights		940 50	12,166 17
	Total sponsor's costs			$16,668 41
	GRAND TOTAL			$31,277 32

THE ANSWER TO A PROBLEM

ALCO PIPE FOR CHICAGO



Cities using ALCO STEEL PIPE include the following:

Auburn, N. Y.
Birmingham, Ala.
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Chicago, Ill.
Cincinnati, Ohio
Clarksburg, W. Va.
Cleveland, Ohio
Denver, Colo.
Detroit, Mich.
Fairport, Ohio
Fort Wayne, Ind.
Elizabeth, N. J.
Hartford, Conn.
Manitowoc, Wis.
New York, N. Y.
Niagara Falls, N. Y.
New Brunswick, N.J.
Ogden, Utah
Philadelphia, Pa.
Salamanca, N. Y.
Washington, D. C.
Wilmette, Ill.

The Water Department of Chicago and the Chicago Union Station were jointly and seriously concerned about the material to use in the 36" line to replace pipe running under the tracks of the station. The answer, illustrated above, is Alco Electric Welded Steel Pipe. No further need to worry about disastrous breaks.

ALCO FEATURES

Greater Strength
Longer Life
Smoother Waterway
Longer Lengths
Fewer Field Joints
Low Initial Cost
Ultimate Economy

Alco Electric Welded Steel Pipe is supplied in diameters from 18" to 120"

ALCO PRODUCTS DIVISION

30 Church Street, New York, N. Y.

CHICAGO WASHINGTON PITTSBURGH HOUSTON TULSA

Plants at Dunkirk, N. Y., and Montreal, Canada

Cable Address: Alproducts

AMERICAN LOCOMOTIVE COMPANY

Pollution and Sewage Treatment

Pollution of Waters Which Surround New York City

THE Annual Report of the Interstate Sanitation Commission recently submitted to the Governors of New York and New Jersey states that more than a billion gallons of untreated sewage is being dumped daily into New York Harbor and its tributary waters. Eighty-six per cent of the communities in the Interstate Sanitation District are violating the conditions of the Tri-State Compact designed to eliminate pollution from the waters in and around New York.

Continuing its statistical presentation, the Report points out that 1,100 fire engines pumping 24 hours per day would be required to remove this sewage from the water. Spaced 50 feet apart along the Manhattan shore of the Hudson River, they would reach from the Battery to Grant's Tomb. If Central Park were flat and surrounded by a wall, the amount of sewage pumped out in one day would fill it to the depth of 6 feet. The flow in a week would increase the depth to 42 feet.

According to the official figures in the Commission's report, the daily volume of untreated sewage poured into the Metropolitan waterways is 1,066,454,000 gallons. Added to this is 542,416,000 gallons of effluent from treatment plants, a daily grand total of 1,608,870,000 gallons.

The quantity of sewage in the water is measured in inverse ratio to the amount of dissolved oxygen. In a natural waterway, where there is no population contributing pollution, the minimum per cent of saturation of oxygen in the water varies from 85 to 100 per cent. If this waterway receives polluting material over a period of years in gradually increasing quantities, the amount of dissolved oxygen in the water is diminished until none is present. When the oxygen content is reduced to an average figure of 30 per cent in a large body of water, there is considerable danger of there being no dissolved oxygen in the vicinity of sewage outlets, which are usually located along the shore line in the vicinity of dwellings or business places.

Records gathered by the Commission indicate that the amount of dissolved oxygen present in the harbor waters around New York has steadily decreased over a span of years. The Hudson River at Spuyten Duyvil north of the city has shown a drop from 72 per cent in 1909 to 40 per cent in 1935, with a minimum of 30 per cent in 1921. In the Harlem River there has been a drop from 55 per cent in 1909 to 20 per cent in 1935. In the upper East River between Manhattan and Long Island the oxygen supply was diminished from 86 per cent in 1909 to 38 per cent in 1934. In the lower East River it has diminished from 65 to 15 per cent.

The Commission further points out in its report that the amount of sewage in the Metropolitan district will continue to increase. As proof of this, it cites the fact that the city of New York is now engaged in the construction of a new water-supply system from which 440,000,000 gallons of water per day will be obtained from the tributaries of the Delaware River, while in New Jersey plans have been made for the early construction of a water supply that will be capable of delivering 100,000,000 gallons of additional water daily to North Jersey Metropolitan area. These waters are sufficient to supply approximately 4,500,000 people. If this number of inhabitants be added to the 9,905,000 listed in the 1930 census figures, the total population will become 14,405,000 contributing sewage, or an approximate increase of 50 per cent.

The Commission concludes that an investment of $300,000,000 to $500,000,000 will be required in the Interstate Sanitation District for sewage-treatment plants to take care of the present and future needs of the district.

Offsetting this expense is the economic loss which the district is now suffering as a result of pollution. In addition to determinable economic losses, the effect of pollution may also be considered from an esthetic and a health standpoint. While data have not been completed on the actual economic losses, the Commission has cited the example of one bathing resort in the Metropolitan area closed because of polluted water, where the drop in revenue was over $1,000,000 yearly. The waters around New York were once a productive source of revenue for the shellfish industry. The gradual increase of pollution has destroyed a business that grossed more than $1,000,000 yearly.

The damage resulting from the depreciation of property values, both unimproved and improved, along the banks of polluted waterways is often very large. Paper No. 72 of the U. S. Geological Survey, published in 1902, states that a few years prior to the publishing of its report the value of land for farming purposes along the Passaic River in New Jersey was from $500 to $800 per acre, and building space was held at a much higher figure. Today, the paper states: "These plots cannot be sold at any price, nor is there any market along the entire shore." The Commission hopes to ultimately evaluate the pollution damages throughout the district from an economic standpoint as well as to estimate its recovery possibilities.

Long-Span Sewage Pipe of Welded Copper Steel at Denver Plant

SPANS of 105 feet are features of the 78-inch diameter of the metal pipe line which carries sewage from the city of Denver, Colo., across the Platte River, to the new sewage-treatment plant. It is reported that this is the longest unsupported span of pipe in the world. The pipe ranges from $\frac{5}{8}$-inch to $1\frac{1}{8}$ inches in thickness. The stiffener ring at the center pier is a 12-inch, 40-pound I-beam rolled edgewise. The legs on this ring are rigidly fastened to the center pier. The stiffener rings at the end of the pipe are 10-inch, 30-pound I-beams, and the legs on these rings rest on patented rollers. An expansion joint in the wall at each end of the pipe allows it to expand both ways from the center.

The pipe was designed as a continuous structure for a maximum combined fiber stress of 9,800 pounds per square inch in the pipe shell, and 16,000 pounds per square inch in the stiffener rings. The maximum negative bending moment at the center pier is 4,138,000 foot-pounds. It occurs at points 39 feet, 4 inches from the end support.

The method of construction used gives savings of 22 per cent over the next most economical design and at the same time offers less obstruction to flow inside the pipe. The pipe was designed and fabricated of copper molybdenum iron by the Lincoln shielded arc process and erected by the Thompson Mfg. Co., of Denver, Colo., for the city of Denver.

THE 105-FOOT SPANS OF THE 78-INCH SEWAGE MAIN ACROSS THE PLATTE RIVER LEADING TO THE NEW SEWAGE-TREATMENT PLANT, DENVER, COLO.

Meet the "WATER SMELLER"

Water Smeller
He Tests Water by Sense of Smell
This Man Tests Water By Unusual Sense Of Smell
WATER SMELLER STARTS SURVEY
TYRONE CHEMIST HONORED FOR ABILITY
"WATER SMELLER" NAMED FOR CITY
HIS NOSE KNOWS, SO HENRY LAUGHLIN HAS WATER SMELLER JOB
His Job Is Smelling Water
BAD WATER FLAVOR DRIVES GOOD COOK TO DISTRACTION
Water Smeller

This demonstrates the value of organized publicity created for the purpose of arousing the interest of Mr. John Public in the important functions of water departments.

HENRY LAUGHLIN (Water Smeller) will be on hand at The American Water Works Association Convention at New Orleans. Arrangements for the future can be made at that time to carry out tests in your own laboratory, showing the effectiveness of AQUA NUCHAR for taste and odor removal.

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INDUSTRIAL CHEMICAL SALES
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230 Park Ave.
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MANUFACTURERS OF NUCHAR ACTIVATED CARBON

The Public Health

Safety-Health Drive in San Diego, Calif.

FEWER absentees and fewer accident victims have convinced the San Diego Civil Service Commission that its extensive safety-health program for employees is a successful way to save taxpayers' money. The San Diego plan, an unusual undertaking for a public personnel agency, was inaugurated two years ago. It parallels the effort of private industry to provide safe working conditions and raise physical standards for employees.

The California city employs a full-time medical examiner. His duties are: to keep permanent health histories of all employees; to give preliminary physical examinations to applicants of the Fire and Police Departments; to examine employees after sick leave; to make an annual check-up on every employee and recommend necessary medical service; and to determine whether the partly disabled employee is physically fit to perform his duties without jeopardizing himself, his fellow-workers, or the public.

This program has resulted in a material reduction in sick-leaves and has saved the city several thousand dollars by decreasing the number of injuries 32.8 per cent. Health check-ups have proved effective. A thorough examination of 94 employees uncovered 23 types of defects, ranging from bad eyes and poor teeth to varicose veins and high blood-pressure.

Since the safety program started, all compensation insurance matters have been centralized through the personnel agency. A Safety Committee, with the City Manager as Chairman, reviews accident cases and ways of reducing injuries, and sponsors first-aid classes.

—International City Managers' Association.

City Abattoirs

THERE are 24 municipally owned abattoirs in the United States. These cities took over meat slaughtering as a public health measure, and there is indication of a growing acceptance of this unusual municipal function, according to a survey made by the American Municipal Association and the International City Managers' Association. Thirty per cent of the meat sold in this country is produced and consumed within the same state and is therefore exempt from the Federal meat inspection laws covering interstate shipments. To protect consumers of this thirty per cent, state and local governments must set up standards.

While some municipalities seem to solve the problem by comprehensive ordinances regulating the construction, location and number of private slaughtering plants, cities in at least one-fourth of the states are specifically authorized to build and operate abattoirs, usually supervised by the Health Department.

Among cities of the 24 that have such plants are: Paris, Texas, which built the first municipal abattoir in the country in 1909; Baton Rouge, La.; Beaumont and Austin, Texas; Albany, Ga.; Winston-Salem, N. C.; Logan, Utah; and Waterbury, Conn. These plants cost from $2,000 to $102,000 to build. Most of them are self-supporting, including the cost of inspection. Among cities with very comprehensive meat-slaughtering ordinances are Seattle, Wash.; Charlotte, N. C.; Grand Junction, Colo.; and San Francisco, Calif.

A municipally operated abattoir has the advantages of: (1) centralizing meat inspection at slaughter, thus reducing the number of places of inspection and eliminating objectionable slaughterhouses; (2) maintaining sanitary conditions and modern equipment for slaughtering at the lowest possible cost to users; (3) providing ante-mortem and post-mortem inspection by qualified inspectors under regulations practically identical with those governing Federal meat inspection; (4) providing ample cold storage space for merchants, consumers and farmers; and (5) enabling farmers to sell some of their animals locally, reducing prices.

The decision to build an abattoir should follow only after the city has made a thorough study of the local situation, the attitude of the public, means of financing, and state laws. Among factors to consider are: the volume of locally killed fresh meat sold for consumption in the community; attitude of the community toward the use of uninspected locally killed meats; attitude of local meat dealers toward the installation of a modern abattoir; value of inexpensive cold storage facilities to local produce men and farmers; the local market for by-products of the abattoir, such as tallow and blood fertilizer; and provisions of the state law and regulations of the state health department relating to meat inspection and slaughterhouses.

Health and Water Supply

THE question has been asked: "What is the relative state of health in small communities having running water and those which do not." This is truly a sweeping question and one not easy of definite answer substantiated by figures. B. A. Poole, Chief Engineer, Bureau of Sanitary Engineering, State Board of Health of Indiana, furnishes an answer based on experience in Indiana, which is helpful.

In Indiana, communicable diseases are reported by local health officers. Communities that do not have public water supplies may not have a health officer; and if they do, he may be backward in reporting. Naturally, the county health officers give the State Board of Health all the information they can, but while all the cases of typhoid may be reported, much diarrhoea is not.

Indiana records do show a higher incidence of typhoid and diarrhoea in southern Indiana than in northern Indiana. This can undoubtedly be attributed to a number of causes, but it is safe to assume that one of the main causes is that a higher percentage of the population depends upon private water supplies. The typhoid average for the state in 1936 was 1.8, while the diarrhoea rate was 9.2 per 100,000 population.

During the fall of 1936 a number of water-borne outbreaks for the period between 1930 and 1935, inclusive, were reviewed for the Committee on Water Supplies of the American Public Health Association. This review showed that during this period no typhoid or diarrhoea could be directly traced to a public water supply. There were several minor outbreaks in municipalities having a public water supply, but all these, which might be attributed to water, pointed to some private water supply. However, the review further showed that all the outbreaks during the period referred to above in municipalities of less than 1,000 occurred in towns that did not have a public water supply.

Typhoid Death Rate

THE following table shows the typhoid death rates, per 100,000 inhabitants, in the United States Registration Area, in Pennsylvania and in Pittsburgh, from 1906 through 1936. In 1907 there were 3,877 typhoid cases in that part of Pittsburgh between the Allegheny and Monongahela Rivers. In 1936 there were six cases, although the population had increased materially in 30 years. The column marked "Pittsburgh Resident" in the table does not include non-residents in the various hospitals in the city.

	U. S. Reg. Area	Pennsylvania	Pittsburgh Resident	Pittsburgh Total
1906	31.4	54.8	110.0	130.3
1907	29.3	48.6	106.6	125.2
1908	24.4	33.0	42.6	48.7
1909	21.2	22.7	17.4	24.6
1910	23.5	24.6	21.7	27.9
1911	21.0	22.0	20.0	25.9
1912	16.5	16.6	8.1	12.8
1913	17.9	18.3	10.5	19.6
1914	15.5	13.2	8.4	15.4
1915	12.4	12.6	6.6	10.5
1916	13.3	13.9	5.5	8.6
1917	13.5	10.7	7.7	11.5
1918	12.6	10.9	6.2	10.0
1919	9.2	7.1	3.9	6.3
1920	7.8	5.7	2.7	5.2
1921	9.0	7.3	3.0	4.1
1922	7.5	4.7	3.3	4.9
1923	6.8	4.9	2.1	3.7
1924	6.7	3.8	2.6	4.2
1925	8.0	4.8	1.3	3.0
1926	6.5	3.7	1.4	2.7
1927	5.5	2.7	1.5	1.8
1928	4.9	2.0	2.1	3.3
1929	4.2	2.1	0.6	2.3
1930	4.7	2.6	0.9	1.5
1931	4.4	2.1	0.4	1.2
1932	3.7	1.8	0.7	1.3
1933	3.6	1.2	0.14	0.14
1934	3.4	1.1	0.9	1.4
1935	2.7	0.8	0.44	0.6
1936	..	..	0.3	0.7

A Well Flushed City is a Clean City . . .

ask—
MUNCIE
Indiana

Germ-laden bacteria-count in loose, flying dust reduced 65% by flushing method

Streets Washed "Spotlessly Clean"

Cleans UNDER "Parked Cars"

Full Width Cleaned in ONE Trip

Adopt FLUSHING now . . . the better, more sanitary, less costly, street-cleaning method. Some cities report street-flushing costs as little as 8¼c per 1,000 square yards. Modern flushing cleans entire street-width . . . UNDER parked automobiles as well . . . reduces hand-labor costs and removes disease-laden flying DUST. Etnyre Street Flushers can be mounted on ANY truck or trailer. A size for every city, large or small. Special equipment for Sewer-Cleaning, Tree-Spraying, Fire-Fighting and Snow-Removal. Sprinkler heads sprinkle Gravel, Macadam and Natural-Soil Streets. Solve your every street-cleaning problem with an Etnyre Sanitary Street Flusher as Muncie, Ind., and many other cities are doing.

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Send for catalog No. 304, describing Etnyre "Standard Four" and "Super-Six" Flushers. E. D. Etnyre & Co., Oregon, Ill., 11 West 42nd St., New York and East Cambridge (Boston), Mass.

Special Sprinkling Attachment

Flusher Unit Quickly Removable

Mounts on ANY Truck or Trailer

ETNYRE

SANITARY STREET FLUSHERS

Public Safety

Parking Meters at Hagerstown

ON December 11, 1937, we placed in service 114 parking meters, which after 33 days of a 90-day trial appear to be a 100 per cent benefit to both parkers and motorists, having solved our parking problems in the business section of our city. They are the Miller meter made by the Duncan Meter Corporation, having a penny feature permitting 12 minutes' parking, and we collect twice as many pennies as nickels.

D. LEE STALEY,
Tax Collector and Treasurer, Hagerstown, Md.

Rochester Police Use Camera for Recording Accidents

HEREWITH is a typical accident photograph taken by the operator of our Safety Car. This is in service 24 hours daily patrolling the streets, carrying a 4 x 5 inch Speed Graphic camera and all necessary equipment to take photographs day or night. The car is also equipped with a loudspeaker to aid in traffic work in the congested districts of the city. It has a complete Red Cross emergency kit, and each operator has been trained in this work.

NIGHT ACCIDENT PHOTOGRAPH TAKEN BY ROCHESTER, N. Y., POLICE WITH 4 x 5 SPEED GRAPHIC CAMERA AT DIAPHRAGM STOP F-16 AND WITH ONE FLASH CARTRIDGE

The Safety Car is radio-equipped and is despatched to all serious accidents where, if necessary, photographs are taken to be used in court should any court action arise from the accident.

HENRY T. COPENHAGEN,
Chief of Police, Rochester, N. Y.

Making Children Careful

EARLY in 1937 this Department organized an Accident Prevention Bureau which functions 24 hours a day, with squads on the street at all times. These squads are equipped with two-way radio and answer all accident calls. While on patrol duty they observe anything that may cause an accident and call it to the attention of those guilty of negligence.

W. LEE ELGIN, MAYOR OF HAGERSTOWN, MD., INSERTING FIRST PARKING METER COIN ON DECEMBER 11, 1937

We have an officer stationed at each school, whose duty it is to explain to the children the necessary requirements of safety. Once a child has the safety movement explained to him fully, it is seldom that a recurrence of a dangerous act is reported.

We hope the year 1938 will show a marked decrease in all accidents, just as 1937 showed a decrease as compared with 1936.

BENJ. BARSEMA,
Chief of Police, Village of Oak Park, Ill.

Fire Chief Qualey, of Medford, Speaking

IN Medford, Mass. (population 60,000), we have in service seven pumpers (two over 15 years old), and combinations, one aerial ladder, and two service ladders (one in reserve). I am favorable to enclosed apparatus, and to voice amplification in fire stations. At school meetings our officers instruct pupils in the proper use of fire-alarm boxes, of which we need about 100, to prevent the mistakes over street names which otherwise can happen.

THOMAS A. QUALEY,
Chief, Fire Department.

Five Counties and Two Cities Served by KADS

KADS, the radio station of the Marysville, Calif., Police Department, went on the air July 8, 1937, and from that time has been in constant service 24 hours a day. This station, while taking care of all the police work of the city of Marysville, also covers the Northern California counties of Yuba, Sutter, Colusa, Glenn and Butte, and has been of inestimable value to all law-inforcement agencies of this district.

KADS was sponsored by the Northern California Peace Officers Association and built through popular subscription. These funds, amounting to nearly $5,000, were raised by a dance and its advertising program.

Since the completion of KADS station, KASG has been installed in the office of the Sheriff of Glenn County, and plans are being made now for another station to be installed in the office of the Highway Patrol in Oroville, Butte County. Later in the year an additional station will be built in the office of the sheriff of Colusa County.

The radio service has become of such value that we wonder how we ever accomplished anything before its installation. Especially is it appreciated by the Departments of Police of Marysville (Chief Dorell Le Fortune) and Yuba City (Chief E. L. McCune). KADS is in constant touch with Highway Patrol station KADJ in Sacramento, and KAPI, Highway Patrol station in Grass Valley. Crime and traffic violations have been reduced in north-central California.

RADIO CARS OF MARYSVILLE

W. E. LANGDON,
Police Judge, Marysville, Calif.

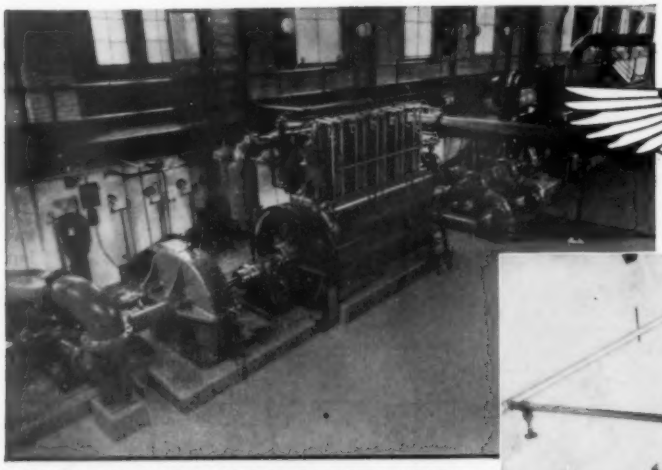
Auto Club Likes Parking Meters

I WILL say without fear of contradiction that the installation of parking meters is one of the finest things that ever happened to Toledo, in speeding up traffic and eliminating double parking. Not only that, a person can find a place to park now, where he never used to be able to.

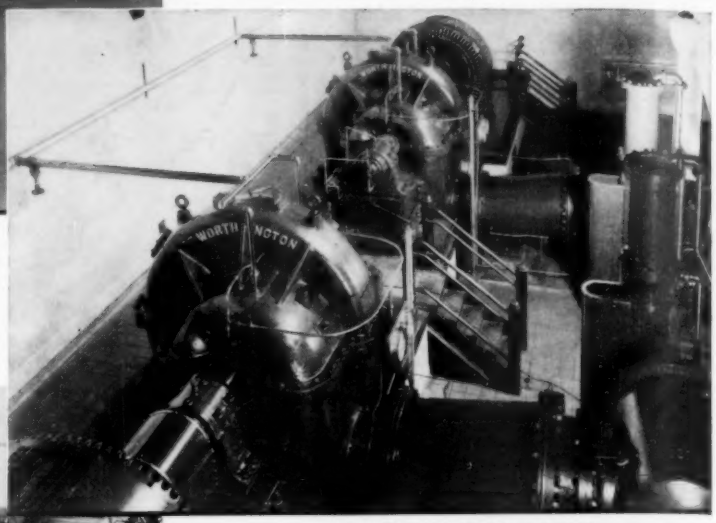
DWIGHT D. HATCHER,
Secretary-Manager, The Toledo (Ohio) Automobile Club.

THE LIE DETECTOR

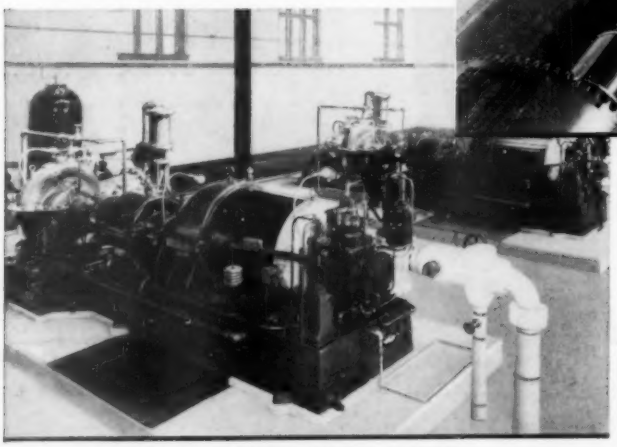
The lie detector at Wichita, Kans., last year tested 1,551 persons, finding 1,163 with clear records and 363 without, and 15 insane. On the basis of the tests, 211 confessed and 51 others were prosecuted. In Berkeley, Calif., also the lie detector is a standard police device.



DIESEL OR GAS ENGINE DRIVEN UNITS
One 8-MGD and one 4-MGD Unit. Worthington 450- and 300-hp. Engines



MOTOR DRIVEN UNITS
Two 40-MGD Units. 1200-hp. General Electric Motors



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Twenty-One Things Can Happen to a Water Meter

Operation of the Meter Service Shop at Springfield, Ill.

By S. T. ANDERSON
Superintendent of Water Works, Springfield, Ill.

ACCURACY is the most important attribute of a water meter. Maintaining accuracy in water meters is therefore the most important duty of a water-meter service shop. The only way to be sure that the service shop is accurate is to have accurate and efficient testing equipment. Beyond that the water department can hardly go.

Here in Springfield there are only 21 things that can happen to a meter, officially. The meter men usually find them and report to the Customer Accounting Division. Sometimes, of course, the customer may find something amiss, especially if the meter has burst and water is all over the cellar floor. Then the customer reports (!) the trouble.

Action!

In either case, a service order is made out by the Customer Accounting Division, a copy is sent to the service shop, and the Service Section swings into action. The defective meter is replaced and taken to the repair shop, a three-part composite record tag is attached, and the meter is ready for the repair man.

Meter Testing

All meters, new and old, that come into the repair shop are tested for accuracy of measurement. The present Mueller testing equipment can handle five ⅝-inch meters at a time, with room for larger sizes up to 2-inch. Meters up to 2-inch may be tested on the right side of the machine, inserted between the two large flanges of the pipe with the double connection for the two flexible pieces of tubing removed. The pipe up left center, in the first illustration, is the discharge pipe which empties into the weigh tank on the scale platform. (See page 59.)

Large meters may be set up on the floor arranged so that their discharge pipe will also empty into the weigh tank. The second illustration shows a 4-inch meter in place for testing. The weigh tank may be observed in position on the platform of the scale. The scale, a Fairbanks Springless, is calibrated for measurements in pounds, gallons, or cubic feet. It may be set for any unit testing rate desired.

During a test on a ⅝-inch meter, one cubic foot of water, as measured on the meter dial, flows through the meter into the weigh tank. The scale dial registers the actual amount of water that comes through the meter, and at the same time registers the per cent difference between the meter reading and the scale reading. Various amounts of water are used in testing a meter to make sure that the meter functions properly at various rates. Larger meters, of course, are tested on larger amounts of water, but the procedure is the same. One-inch and up to 2-inch meters are tested on 10 cubic feet of water; 2-inch and larger meters are tested on 20 cubic feet of water.

Accuracy within 2 per cent is required of every meter: since 100 per cent is perfect, the allowance is between 98 per cent and 102 per cent. Deviation of more than this 2 per cent from the scale reading sends the meter to the repair bench for adjustment or dismantling.

Meter Repairing

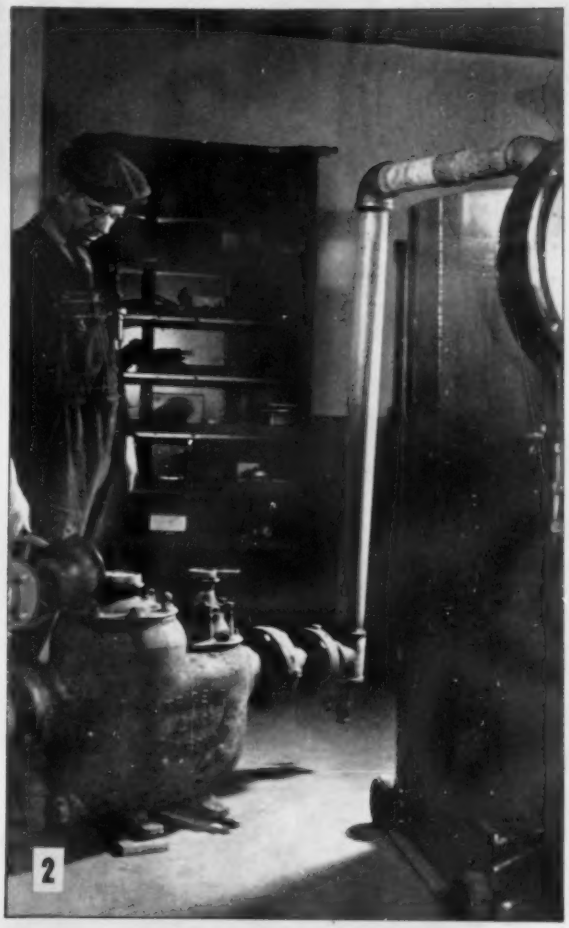
Meter repairs are made by competent workmen at an up-to-date repair bench. Hot and cold running water, plenty of electric outlets, individual lights, revolving containers for small parts, separate drawers for larger parts, and other handy arrangements, make this section of the shop a most efficient work-bench.

The tagged meter-to-be-repaired is disassembled to the last nut. Each part is cleaned, inspected, and renewed if necessary, before the meter is put together again. Thorough hot-and-cold-water scrubbing of the parts removes all dirt particles that may have collected and insures that the reassembled meter will be as good as new. Gear trains are checked, register dial gears lubricated, and dial faces washed. Every part must be as good as new.

The meter is reassembled and retested before it goes to the stock shelf for replacement in somebody's cellar. But

FORMS USED BY THE WATER, LIGHT & POWER DEPARTMENT OF SPRINGFIELD, ILL., TO KEEP A RECORD OF METERS AND COMPLAINTS

1. Meter Record Card. 2. Front of Meter Service Card. 3. Back of same card. 4. The Service Order Form. 5. Back of Complaint Report, the front being shown in 6



TESTING AND REPAIRING METERS IN THE WATER DEPARTMENT SHOP, SPRINGFIELD, ILL.

1. Mueller water-meter tester with multiple attachment with five ⅝-inch meters in the shop. 2. A 4-inch Trident meter under test with discharge pipe to the weigh tank on the scale platform. 3. Repair bench in meter shop with repairman making an entry in his record book

such is a meter's life in a modern water-meter service department.

Keeping Records and Making Reports

Keeping track of some 20,000 water meters is a job in itself; keeping them all in repair and keeping track of all of them that are repaired just complicates the system. Report forms and record files are obviously a necessity.

Trouble Report.—Each meter reader has several perforated sheets listing the various troubles that can beset a water meter, a meter box, or a curb box. If trouble is encountered, the reader simply writes the number of the meter, the address, and the number of the difficulty as listed, at the bottom of the sheet. This sheet is turned in to the Customer Accounting Division the same evening.

Complaint Report.—Customers, at times, report trouble by telephone; at other times, they come to the office and report trouble "over the counter." In either case a complaint report is filled out giving the who, what, where, when, and why of the trouble, whether it be meters, services, mains, hydrants, or other complaints. This report goes to the Customer Accounting Division.

Service Order.—The Customer Accounting Division issues a service order, based on either the meter reader's trouble report or a customer's complaint report. At the top of the order is the service desired: first service (FS), water on (ON), water off (OFF), remove meter (RM), change meter (CM), non-payment (NP), or change tenant (CT). One or more of these is checked by the office, the order is filled out indicating the trouble and its location, and a copy is given to the Service Division for action.

Meter Service Card.—When the defective meter arrives at the service shop, a three-part composite tag is attached. The lower part is a shop record which identifies the meter and on which is filled out a record of tests and repairs. This part is detached and sent to the record clerk, who places the record in the 4½ x 6½-inch filing envelope of the particular meter that is being repaired. Each meter on the city's water lines has a filing envelope, giving such information as make, size, number, location, date in, and date out, so it is possible to tell where every meter is, how often it has been repaired, and what the repairs were.

The second part of the composite tag is removed when the meter is set; this part returns to the record room, also.

The third part, the tag itself, stays with the meter until somebody tears it off. A tagged meter, then, indicates that it is a repaired meter.

A meter's trip from the cellar of a house through the repair shop and back to another cellar is very orderly, but it takes a carefully kept complete record to keep it moving and to know where it is.

Personnel

The Water and Light Department of the city of Springfield is under the supervision of Willis J. Spaulding, Commissioner of Public Property, with Charles H. Spaulding as General Superintendent, S. T. Anderson as Superintendent of Water Works, and L. W. Hagel as Superintendent of Distribution. The repair and the maintenance of meters is under direct charge of Mr. Hagel.

New York State Federation of Planning Boards Launched

FOR some time the need for a federation of local planning agencies in New York State has been recognized. In the past each local planning board and zoning board of appeals has functioned as an isolated unit. There has been no machinery by which local boards throughout the state could get together for the comparison of notes and the discussion of common problems. In several other states such organizations have been functioning successfully for some time. The Westchester County Planning Federation in this state has for the past twelve years demonstrated the value of a county-wide federation.

At the planning conference in Syracuse last December, a resolution was adopted calling on the Chairman to appoint an Organization Committee to formulate a constitution and by-laws and to designate from its membership temporary officers of a state-wide federation of planning boards. A committee was appointed on which were represented village, city, county and regional planning boards and zoning commissions and boards of appeals. That committee met in Albany on February 24, drew up a proposed constitution and by-laws for the new organization, and chose as temporary officers J. Franklin Bonner, President; M. P. Catherwood, Vice-President; and T. W. Mackesey, Secretary-Treasurer.

All official planning agencies, including zoning boards of appeals, in New York State are eligible for membership. Associate membership is open to unofficial organizations and to individuals interested in planning.

The objects of the Federation are to provide a medium for the interchange of ideas and experiences in planning and zoning matters and for the dissemination of information, to arrange for state-wide meetings and conferences on subjects of general or special planning interest and to sponsor legislative programs for the improvement of the planning laws.

To assist in the solution of local problems, many of which are strictly sectional, the state has been divided into eight districts. Each district will form a unit of the state-wide organization and have representation on the Board of Directors. The first state-wide conference under the sponsorship of the Federation will be held this spring.

Detroit Rebuilds 149 Miles of Street-Car Tracks

APPROVAL of an allotment of $990,994 to continue rehabilitation of the Detroit Street Railway system, in progress since 1935, has been announced by the Michigan Works Progress Administration. Immediate employment is given 800 men in addition to 400 workers now on the job. This project provides for the reconstruction of 26 miles of track. The Federal funds are supplemented by the city's contribution of $497,102.

Under two earlier WPA projects, 58.8 miles of track have been rehabilitated and 65 miles of unpaved track overhauled, at a Federal cost of $2,809,299 and a city cost of $1,052,908. The new project brings the total number of miles of track rehabilitated or overhauled to 149, or about 33 per cent of the total mileage in the system.

New Water-Softening Plant at Daytona Beach, Florida

By DR. A. P. BLACK
Professor of Chemistry, University of Florida
and
R. G. HICKLIN
Manager, Municipal Engineering Department, Robert & Company, Inc., Atlanta, Ga.

EVEN when only a small community, this world-famous beach city recognized the value of soft water and was one of the first Florida cities to build a softening plant. Likewise, when PWA made funds available to cities for water-works projects, Daytona Beach was one of the first to apply for funds to build a new and modern softening plant of adequate capacity to supply their increased requirements. The new plant, which was completed in June, is of 4,000,000 gallons per day capacity.

The city is divided by the Halifax River, about two-thirds of the population being on the mainland and one-third on the peninsula or beach side. Formerly the city was served by two separate plants and systems, one on the mainland, the other on the peninsula, there being no connecting line across the river. The split operation naturally required two separate operating crews, separate metering points for power, etc., and resulted not only in various operating difficulties, but also in a relatively high operating cost.

The new plant combines all operations in one plant and serves the entire city; therefore, considerable saving is effected in both labor and power costs. Although a more complete treatment is provided in the new plant, the savings effected, due to reduced labor and power costs, better equipment and chemical control, will be sufficient for amortization of the cost of the new plant.

The new plant is located on the mainland, on the site of the old mainland plant. The project, in addition to the new plant, includes a new well supply of ten wells, located one mile west of the plant and old mainland well supply, a raw-water pumping station and force main to the new plant, consolidation of other electrical city services at one switchboard in the new plant, a new feeder main from the plant through the business section and across the Halifax River to the peninsula section, and an R. D. Cole 200,000-gallon elevated storage tank on the mainland and a like amount on the peninsula or beach side of the city. The entire project was financed by PWA funds. The cost was $289,000, of which $130,000 was a PWA grant, and $159,000 a PWA loan, secured by city of Daytona Beach water revenue bonds.

Lime-Soda Softening

The softening plant is a lime-soda plant and consists of aerators, mixing chamber, clarifier, settling basin, recarbonation chamber, and filters. Two Infilco multi-cone aerators were provided, arranged so that either one or both aerators may be used. They are mounted adjacent to and above the mixing chamber so that flow is by gravity to the chamber.

The mixing chamber is a concrete structure, rectangular in plan, and has a ratio of width to length of 3 to 1. It is equipped with an Infilco mechanical mixer with wooden paddles carried on chains and sprockets, which impart a spiral flow to the water, insuring proper mixing. The mixing chamber is located adjacent to the filters and extends partly under the chemical feed room. Water enters by gravity from the aerator at a point under the chemical feed room, where the chemicals are introduced, and flows lengthwise of the chamber thence through a 24-inch line to the clarifier.

The clarifier is a circular concrete tank, 60 feet in diameter by 14 feet deep, and is equipped with a Link Belt Circuline sludge collector. The sludge collector consists of a revolving bridge which travels at a peripheral speed of approximately 4 f.p.m. The bridge is propelled around the tank to collect the sludge by means of a galvanized chain which lies in the effluent trough. A 2-foot 6-inch wide Straightline sludge collector traveling at a speed of 2½ f.p.m. and supported by the revolving bridge conveys the lime sludge which is collected by the bridge to a center sump. The center sump is covered by a steel plate which

THE NEW SHALLOW-DEPTH 200,000-GALLON STORAGE TANK WHICH REPLACES THE 20-YEAR-OLD TANK AT THE RIGHT

has an opening at the discharge point of the Straightline collector. This plate revolves with the bridge and insures a sludge of a uniform maximum density. From this point the sludge is removed with a conventional type sludge pump. The influent enters the center of the tank through a diffuser ring and is taken off with a weir extending around the entire outside edge, from which point it is conveyed by a flume to the settling basin.

The settling basin is of concrete, rectangular in plan, and with a ratio of width to length of 2 to 1. The influent flows lengthwise of the basin and thence by a flume to the recarbonation chamber.

The recarbonation chamber is also rectangular in plan, with a ratio of width to length of 2½ to 1. The bottom is provided with a cast iron manifold and lateral system for uniformly distributing the CO_2 gas, which is provided by a fuel-oil-fired furnace, scrubber, and compressor, located in the filter building.

Four filter units are provided, each of 1 mgd capacity. These are rectangular, open concrete tub units, of the conventional rapid sand type, rated at 2 gpm per square foot of filter area.

All filter valves are hydraulically operated and are controlled from operating tables located in the filter building. Each filter is equipped with rate controller, recording loss-of-head, and rate-of-flow gages. The filtering area is uncovered, the filter house wall being located on the front wall of the filter. The operating tables and all filter valves, except the influent valves, are inside the filter building, large windows being provided so as to observe the filters during washing and operation.

Filtered water storage of 150,000 gallons is provided under the filters, with an additional 250,000 gallons storage in a covered circular clear well located adjacent to the plant.

Pumping Equipment

Service pumps for pumping from the clear wells into the distribution system and the elevated tanks are located in the filter building immediately in front of the filter units. These consist of three 1,500-gpm and one 900-gpm electrically driven pump and one 3,000-gpm gasoline-engine-driven pump.

Two 1,400-gpm and one 1,000-gpm raw-water pump for pumping the old well field are also located in the filter building, as well as the 6,000-gpm wash-water pump. Pumps for the new well field located one mile west of the plant are operated by remote control from the filter building, this equipment consisting of one 1,400-gpm and one 2,100-gpm electrically driven pump.

The filter building also houses the recarbonation equipment, chemical feeders, alum, carbon, and soda ash storage, laboratory, general office, meters, samplers, etc. The building has a structural steel frame with concrete block side walls. The exterior is buff-colored stucco with light-grey cast stone trim and a red tile roof.

Quicklime is unloaded, stored and slaked in a separate building in order to prevent unsightliness around the filter building. This building is of reinforced concrete and is located several hundred feet from the main filter building, and adjacent to a railroad siding. The lime is unloaded from railroad cars directly into a Link Belt elevator, which discharges it on the second floor. The slaker is an Infilco continuous feeder and slaker, and is located on the first floor and charged by a hopper extending to the floor above. The slaked lime putty is diluted upon discharge from the slaker, and the diluted milk of lime solution is pumped to the mixing chamber by small centrifugal pumps.

Character of Raw Water

The limestone formations of the Florida peninsula contain, as a rule, little or no magnesium carbonate, and ground waters having their source in these formations are usually characterized by high calcium hardness and relatively low magnesium hardness. This is true of waters from wells in both the old and the new well fields at Daytona Beach. Previous to beginning operation of the new plant, frequent tests were made of the chemical quality of the water from each individual well in the new field. Wide variations were noted, the total hardness ranging from a minimum of 156 parts per million to a maximum of 351 parts per million.

The plant began operation on July 1, 1937, at the rate of 1½ million gallons per 24 hours, all of the water being derived from the new wells. Daily tests of the individual wells were continued, and within a short time, less than two weeks, variations between individual wells had dropped to less than 5 per cent. Carbonate hardness averages about 232 ppm, and non-carbonate hardness about 42 ppm. Sulfates are low, averaging about 10 ppm, and the chloride ion is approximately 120 ppm.

"Salting" of Wells

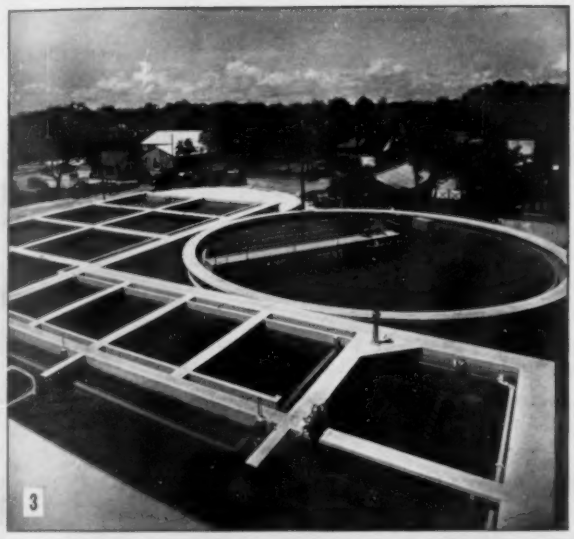
The figure quoted for the chloride ion is particularly significant in the case of well supplies located near the coast in the Florida peninsula. Heavy draught on wells so located may result in the gradual or even abrupt "salting," and the wisdom of the daily testing of individual wells was soon demonstrated in this instance. Overnight, the chloride content of one of the wells in almost the exact center of the field rose from 185 ppm to almost 2,000 ppm. This well, located within 300 feet of three other wells, had been drilled about 50 feet deeper than the rest in an attempt to increase the flow. It was immediately shut off and later plugged.

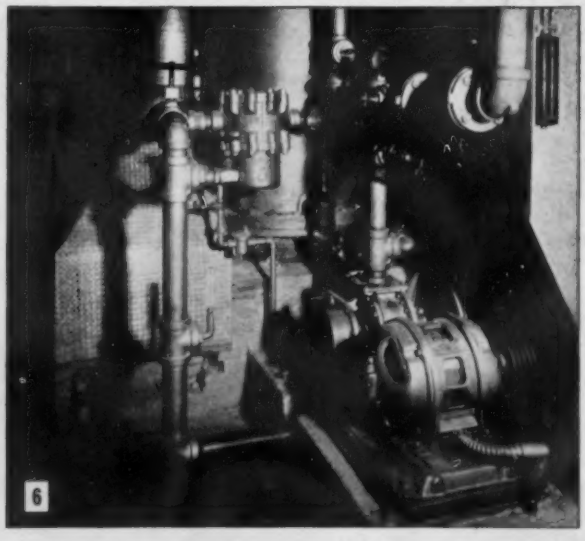
It was then thought best to reduce the draught on the new well field, and accordingly pumping was begun from both fields, 60 per cent from the new field and 40 per cent from the old field, the ratio being kept constant for obvious reasons. This program has been continued, and throughout the nine months of operation of the new plant, no further trouble has been experienced from this source.

Chemical Treatment

Softening is effected by the addition of 13.1 grains per gallon of unslaked lime, 0.6-grain per gallon of alum being added as a coagulant to facilitate settling. Careful control of the temperature in the solution-type slaker has been found to be quite essential. This is obtained by careful regulation of the volume of water admitted to the slaking compartment, and a temperature of 160-165 degrees F. has been found to give best results.

Although softening to moderate causticity with excess lime, followed by recarbonation, has been shown to yield low values for residual alkalinity, such treatment is not





THE DAYTONA BEACH WATER-SOFTENING PLANT

1. Southeast corner of the plant. 2. Northeast corner, showing details of the main entrance. 3. View from main building roof showing filter units with hydraulic influent valves in foreground, mixing chamber at right, recarbonation chamber in center, settling basin at left, and clarifier at right. 4. Filter and pump-room, filter operating gallery on the right, service pumps below, and the filter wash-water pump immediately below the stairs. 5. View in opposite direction from No. 4, showing part of operating floor and door to chemical feeder room on left. 6. The recarbonation equipment

justified in this particular instance. The old softening plant was of the "fill-and-draw" type, using compressed air for mixing, and was not provided with recarbonation equipment or with filters. As a result, the distribution system had become badly encrusted with a coating of calcium carbonate. The logical procedure appeared to be the production in the new plant of a water of fairly low pH value and containing a predetermined excess of free CO_2, in order that most of this incrustation might be dissolved, leaving just enough in place to provide a protective coating, which would then be maintained by careful regulation of the pH value. This being true, the use of excess lime in the softening process would be poor economy for three reasons: first, its own cost; second, the increased cost of recarbonation, no small item when fuel oil is the source of the gas; third, increased hardness of the water due to resolution of the calcium carbonate which would be precipitated by the CO_2 in the recarbonation basin. On the other hand, of course, under-treatment gives poor removal of magnesium hardness. Much study has been given, and is being given, to this problem. Samples are collected at several points throughout the plant every two hours, and some very interesting data have been accumulated, with respect both to the treatment in the plant and to the rate of increase of alkalinity in the distribution system due to resolution of the incrustation in the mains.

The water which passes to the filters normally has a very low turbidity, and the presence of free CO_2 insures freedom from caking of the filter sand and long life for the filters. Filter runs average 48 hours and wash-water consumption is low, averaging 1¾ per cent.

The hardness of the finished water varies from 88 to 95 parts per million. During the nine months of operation of the new plant, the chemical cost of treatment, including softening, recarbonation and sterilization with chlorine has averaged about $13.30 per million gallons. Taste and odor troubles are unknown, and consumers are delighted with the greatly improved quality of the water from the new plant.

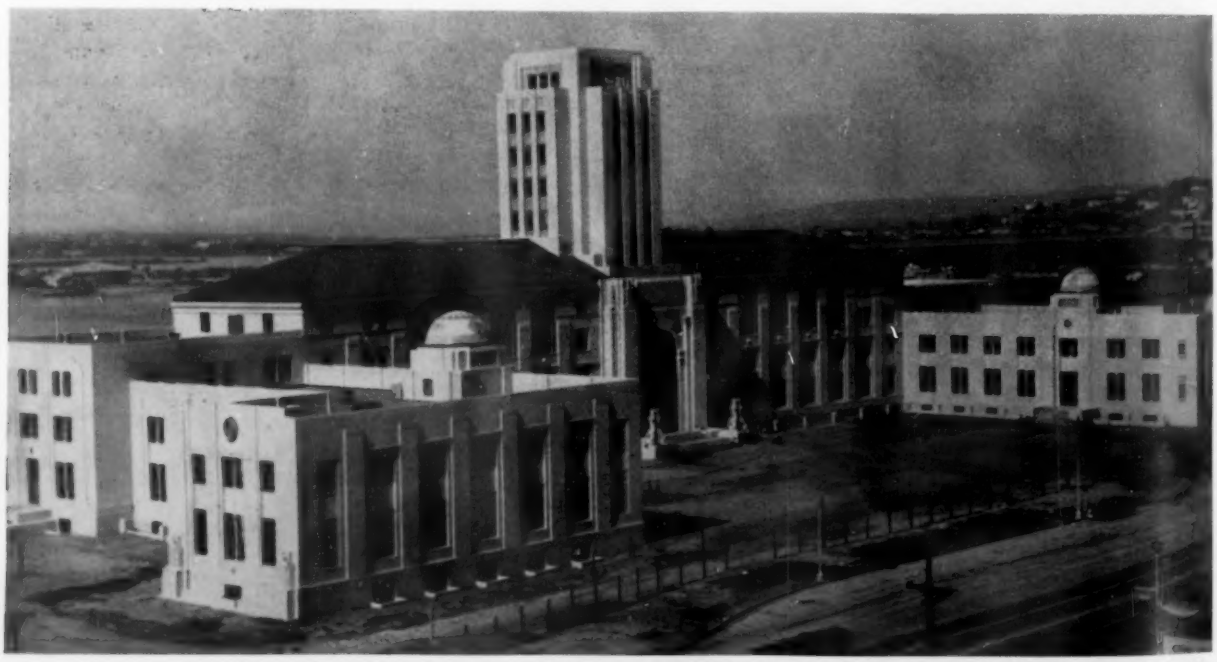
Laboratory Control

A large, well-lighted and completely equipped laboratory in charge of an experienced chemist provides careful and continuous control over each step in the treatment of the water. The laboratory is equipped not only for the usual routine determinations, but also for complete sanitary and mineral analysis of raw and treated water and for bacteriological control. In addition, research is being continually carried on to perfect better methods of treatment for this particular water and to effect economies in the operation of the plant.

The plant was designed by Robert and Company, Inc., architects and engineers, of Atlanta; C. S. Carter was the resident engineer in charge of construction. Chemical control and chemical operation of the plant is under the direction of Dr. A. P. Black, Professor of Chemistry, University of Florida. F. R. Mills, Director of Utilities, Daytona Beach, is in charge of the entire operation of the plant and the water-works system.

San Diego City and County Administration Building

Assembles Many Scattered Offices



The new City and County Administration Building of San Diego, Calif., constructed with the aid of the WPA, is 545 x 245 feet in plan, with a tower 150 feet high, and cost $1,600,000. It replaces not only the old San Diego County Court-House and the City Hall, but assembles the scattered offices which which were costing $150,000 rent

The Maintenance of Sludge Collectors in Sewage-Treatment Plants

By H. F. WATSON
Engineer, Link-Belt Company, Philadelphia

MECHANICAL devices for cleaning the bottoms of sedimentation basins are used in practically all sewage-treatment plants today. There are three main types of sludge collectors: run-around machines for round tanks, some found in square tanks; bridge type machines for rectangular tanks; and conveyor type collectors for rectangular tanks of all sizes and kinds. As it is impossible to discuss the three types in detail in an article as short as this, only the conveyor type sludge collector will be dealt with here.

Lubrication is the most important single item of maintenance. Conveyor type machines such as Straightline sludge collectors, as designed today, require only a minimum of lubrication. It is extremely important, however, that the few parts requiring lubrication receive it regularly.

Lubricating Speed Reducers

Motorized speed reducers, or gear motors, are commonly used for driving sludge collectors. They require very little attention other than keeping them filled with the proper oil. The oil level should be checked at frequent intervals, especially when the equipment is new. Only the oil specified by the reducer manufacturer should be used. The equipment manufacturer usually sends full instructions for lubrication, either attached to the reducer when shipped, or in a separate manual. If the plant operator does not have this, he should write to the reducer manufacturer, giving the reducer name-plate data and serial number, and request it. Speed reducers should not be dismantled for inspection or repair by anyone except an expert mechanic, preferably one familiar with similar units.

Motors

Motors should be lubricated in accordance with the instructions given on the instruction card attached to the motor when received. The instruction card should be detached from the motor, marked with the name and location of the motor, and preserved in the plant operator's office. The drive end bearings of motors used on motorized reducers are usually lubricated automatically through the oiling system of the reducer itself.

Babbitted bearings, used on the countershafts found on installations where two or more collectors are driven from one motorized drive unit, should be greased once a week, either through the pressure-type fittings or by turning down the grease-cups on the bearings.

Open gears should have a heavy grease applied to the teeth by means of a wooden paddle about once a week.

Chains used for driving the sludge collectors from the speed reducer or countershaft should be lubricated once a week by applying a heavy water-resistant grease with a paddle or brush.

The sludge collector parts below the water-line in the tank do not require oiling or greasing, since they are designed for water-lubrication.

Restarting a Collector

While it can be seen that sludge collectors in normal operation require very little care and attention, it is not common knowledge that considerable damage to them can result from the machines' being out of service for any length of time, unless certain definite precautions are taken to prevent it. When a settling tank is not being operated in the regular way, it should, if at all possible, be kept full of clarified sewage or water. The collector should be operated for half its normal travel every two or three days. Turning the machine over in this way will keep the bearings and chain joints free and prevent the warping of the wooden flights, which would occur if these were left in one position for a lengthy period of time, especially where the flights are used for skimming and the top edges of the flights on the skimming run are exposed to the air. In cases where it is necessary to keep collectors idle in a dry tank, especial care must be taken. The flights should be removed from the chains and stored under cover, piled flat with spacers between them so that the air can get at all surfaces. Chains should be coated with a heavy waterproof grease. When putting collectors back into operation, chains and bearings, normally water-lubricated, should be doused with light oil, and the machines operated to make sure everything is moving freely, before turning sewage into the tank. If the chain joints have become stiff and show a tendency to kink, the kinks should be doused with thin oil or kerosene and the links worked on the pins by hammering them through a block of wood. The links should not be struck directly with a steel hammer.

Shear Pins for Safety

Shear pins are usually furnished in the drives to prevent damage to the equipment in case any part of the collector becomes jammed or large foreign objects get into the tanks. Pins with the smallest neck diameter that will drive the collector under normal conditions should be used. The neck diameter when once determined should not be increased even if occasional breakages of the pins occur, for these breakages may be expected from starting shocks or fatigue in the metal of which the pins are made. When shear-pin breakages occur repeatedly at short intervals of time, the tank should be drained and the machine inspected to make sure everything is in perfect order before pins with larger necks are resorted to.

It is necessary that the sprocket or gear driven through

the shear pin be free to rotate on the shaft when the pin shears, if full protection is to be secured. It is a good idea to remove shear pins from the hubs every few months, force grease between the bore of the wheel and the shaft, through the grease fitting provided in the hub of the wheel, and let the shaft turn freely in the wheel for a few moments before replacing the pin.

Slack in Chains

Excess slack should be removed from the chains when observed, either by means of the take-up screws found on the machines with four corner turn-shafts, or by removing links from the chains on machines having only three corner turns. Care should be taken to be sure that the same adjustment is made to both chains. Both take-up screw nuts should be moved the same number of turns, keeping the shaft square with the center line of the machine. When links are removed from the chains, they should be taken from points in the chains exactly opposite each other, and the same number of links should be taken from both chains.

Service Regularly

The very fact that conveyor type sludge collectors require so little attention is likely to prove a pitfall for the unwary plant operator. That thing that does not have to be done every day is often forgotten. Given the little attention they require regularly, these machines will give many years of trouble-free service, with little or no expense for repairs.

Park and Playground Bleachers Built with Relief Labor

Scheme Devised by City Engineer Adds Seats in Thirty Locations in Birmingham

SPECTATORS enjoy sports much more if they can sit during the less exciting moments and stand up and shout when there is a base hit or a long run, and "stretch in the seventh." The high school fields and playgrounds where athletic events take place in Birmingham, Ala., were woefully lacking in bleachers until J. D. Webb, City Engineer, devised a relief project to cast concrete slabs, and, with the help of iron brackets and 2 x 6-inch planks all bolted together, made rows of comfortable seats.

First, the 5-foot concrete slabs, 16 inches high, 4 inches thick, and with a 2-inch bevel at the top and ½-inch grooves at the ends forming holes for the bolts when the slabs were butted together, were cast in wood forms by relief labor, cured and rubbed to smoothness where necessary, to give a neat appearance. The slope of the bevel is 42 degrees, which is the slope of the slab as set in the ground, and the bevel forms the support for the iron bracket supporting the wood seats.

The concrete slabs protect the ground from erosion, and with grass or gravel between the rows the ground is prevented from becoming either muddy or dusty. In setting the slabs, stakes are set at the proper spacing and elevation at the ends of the rows, a string is stretched across, and the slabs are set much the same as curb. Each slab is pushed up close to the adjacent slab so that the grooves in the ends form the holes for the bolts.

The brackets are 2 x ¼-inch strap iron bent to form a long leg running down the face of the slab in front, and a flat supporting section resting on top of the bevel. About 6 inches above this is the horizontal piece with four holes for bolting two 2 x 6-inch planks for the seat. The brackets are made on a bending machine in the city yard without heating the material. With a long piece of the strap iron it is possible to make a number of brackets in the machine one after the other without wasting any material. The drilling of the holes for the bolts through the concrete slab and for the wood planks is done by jigs in the city shop, making the whole job flexible and accurate and the slabs and brackets interchangeable. Furthermore, the work can be done in bad weather, getting a stock of the slabs and brackets ready for assembly in the various parks and high-school playgrounds as soon as weather improves.

THOUSANDS OF BLEACHER SEATS LIKE THESE HAVE BEEN PROVIDED FOR SCHOOL ATHLETIC FIELDS AND PARKS IN BIRMINGHAM, ALA.

SETTING UP THE PRECAST CONCRETE SLABS TO FORM BLEACHERS ON AN ATHLETIC FIELD IN BIRMINGHAM, ALA.

Allowing 18 inches per person on these bleachers, an installation of 10 rows of 30 slabs each will seat 100 people per row, or 1,000 in the 10 rows. Such an installation was recently made at the athletic field for the Phillips High School, and it will be possible to double the seating capacity very easily and economically if needed. Groups of these seats have been provided in over 30 parks and other places in Birmingham with capacities ranging from 500 to 2,000 seats in the individual locations.

The work of casting the slabs has been done as a WPA project, and a good stock of the slabs is ready for installation under the supervision of city employees.

Assessing Cost of Pavement in Streets Having Islands or Grass Plots

THE New York State Bureau of Municipal Information has recently published the answers of a number of cities to the question: "How does your city assess the cost of pavements on abutting property owners on streets in which there are islands or grass plots"? Following are a few representative answers in brief:

Binghamton: Where islands or parkways exist, first the amount which is chargeable by law to any public service corporation is deducted from the total cost of the pavement, and then one-half of the balance is assessed to the city at large and the other half to the owners of real estate fronting upon the street in proportion to the number of front feet which each owns thereon.

Buffalo: The paving cost is divided by the total number of lineal feet benefited, including frontage of the island, and the City of Buffalo pays its portion the same as property owned by individuals.

Mount Vernon: Our procedure is to apportion against the island its proportionate share of the cost the same as if it were private property.

Newburgh: Parks or no parks, two-thirds of the total cost of paving is paid by the city and one-third by the abutting property owners.

Niagara Falls: The cost of pavement is borne by abutting property owners regardless of whether there is a parkway or not.

Rochester: Whatever the cost of paving where there are grass plots, it is included in the whole job, and the assessment is levied on the abutting property owners. This city believes that where there is a large square or a large island plot involving large areas of pavement beyond the normal width of the adjacent streets, some standardization in method of assessment should be studied, since otherwise the abutting property owners might bring about a lawsuit if the whole cost of such a project were levied against them.

Syracuse: If the pavement on each side of the parkway is 13 feet or less in width, the property owners pay for the entire width of the pavement plus curbing on the park side and the property owner side. However, if the pavement on each side of the parkway is over 18 feet wide, the city assumes the cost of the additional pavement and also the curbing on the parkway side.

Scheme to Attract More Industries

LANCASHIRE has launched a scheme to apply the building society system of property purchase to factory premises. Financed by the British Governments, banks, insurance companies, and the London, Midland & Scottish Railway Co., the Lancashire Industrial Sites Co., Ltd., has been formed to operate the scheme. It is the first enterprise of its kind to be established under recent legislation and has an initial capital of more than a quarter-million pounds.

The company's aims and proposals were described to a meeting of Lancashire's industrial and municipal leaders by Sir Thomas Barlow, Chairman of the Lancashire Industrial Development Council. "The purpose of the new company," he said, "is to buy and recondition existing factories and to buy land and build factories thereon to meet the requirements of prospective tenants in a number of districts in the Lancashire area which will be approved for the purpose." The advantages to potential industrialists are that they can obtain factories adapted or built to their requirements, either by outright or spread-over purchase, or by rental, thus avoiding personal expenditure on land and buildings when establishing a new industrial enterprise. The Sites Co., although it will not provide liquid capital, can, under certain conditions, sanction applications by tenants of its properties for development loans from other funds.

The management and control of the Sites Co. will be the same as that of the Lancashire Industrial Development Council, which has attracted many new industries to Lancashire within the last six years. The six directors will include one nominated by the Government, which has provided 25 per cent of the capital.

Enquiries from interested industrialists are already being dealt with.

(From *Industrial Britain*, February, 1938.)

Municipal Iris Gardens

By J. R. FAIN
Secretary, Winston-Salem Chamber of Commerce

THE new municipal iris gardens in Winston-Salem, N. C., which last year reached a high peak of perfection and attracted hundreds of visitors to the old Southern city, offer another successful demonstration of the sound advice of city planners to make the most of parkways and other public areas.

Here are the simple facts as C. R. Faust, Superintendent of City Parks, gives them. (See views at left.)

Winston-Salem is located on the Piedmont Plateau, which has a rolling topography. In the residential sections, the streets for the most part follow the grades of the hills, leaving small triangles and irregular areas. The largest of these was a narrow, four-acre tract in the heart of one of the most desirable residential sections. When the streets on either side were paved, it was left as a raw, red, unsightly gully, with a few good trees and a straggling, root-choked little stream.

In 1929 a quantity of top soil was hauled in, and several loads of grass seed were sown, partly to prevent erosion, which was washing the soil over the curbings. Two years later, one of the flower-lovers of the neighborhood, Dr. Frederic M. Hanes, of Duke University Hospital, offered to donate his surplus iris rhizomes for the parkway, provided the city would take proper care of them.

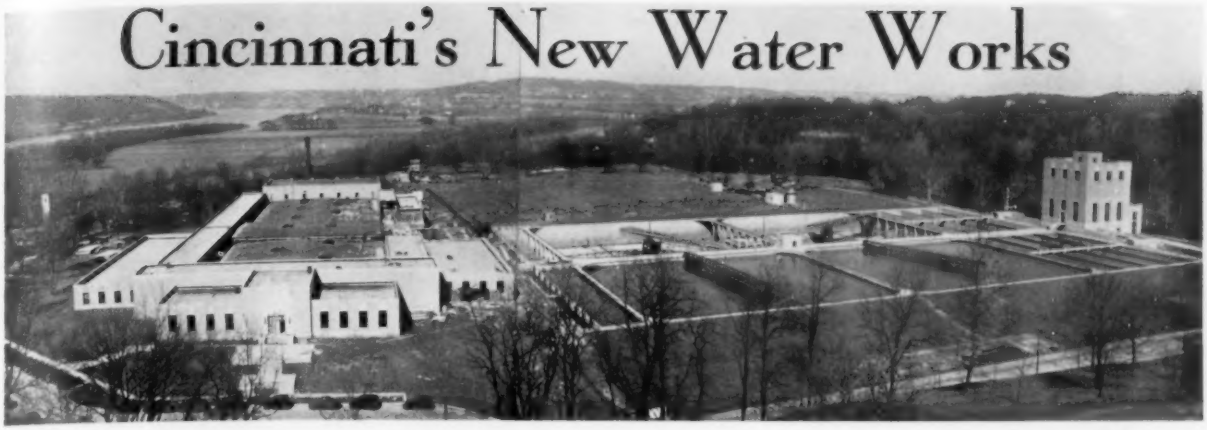
The first experiments showed that the sloping land, well-drained as it is, lent itself particularly to this type of plant. Other iris growers became interested, with the result that from year to year the gardens have been enlarged and improved without cost to the city for several thousand dollars' worth of exceptionally fine iris. At present, there are approximately 20,000 German iris of 525 varieties, 3,000 Japanese iris, and an assortment of Siberian and other types. Each year, as various beds are separated, new beds are planted, for iris multiplies rapidly.

The cost to the city in care and upkeep has been negligible. A few weeks of transplanting in the late summer, and some cleaning up and culture in the early spring, assure an effective display. Through the cooperation of other city departments, ample quantities of sludge from the municipal disposal plant have been provided for fertilizer, with most gratifying results.

These are the facts, but they do not begin to tell the story, for the gardens have proved an increasingly valuable civic asset. The interest and enthusiasm engendered by the municipal project in city beautifying have spread throughout the community. In nearly every garden there are good varieties of iris and other spring flowers that were not here a few years ago. Even the school children speak familiarly of Dolly Madison, King Tut, Imperator, Cameliard, and other famous medal winners of the iris family. In 1937, several of the botany classes spent many interesting hours examining the different varieties. This year they will try some hybridizing of their own.

The city is so encouraged by the success of its beautiful gardens that it has already started a peony garden in another residential section.

Cincinnati's New Water Works



Plant Nearing Completion Has Ultimate Capacity of 200 Million Gallons Daily

By C. S. TIMANUS
Burns & McDonnell Engineering Company, Kansas City, Mo.

EARLY this summer the city of Cincinnati will dedicate its new water purification plant now being completed at a cost of $3,250,000. The plant has an ultimate capacity of 200 million gallons per day and represents the culmination of a unique program of engineering and construction involving the building of the new plant on the exact site of an existing plant without at any time seriously interrupting service to the city. This program was necessary partly because of the scarcity of desirable plant sites, and partly because it was possible to incorporate many features of the old plant in the new design. The economy of the plan developed is reflected in the unit cost of the project, amounting to approximately $16,500 per million gallons of installed capacity as determined by conventional or standard ratings.

No sacrifice of standard methods of water purification was permitted in the process of utilizing parts of the old plant. Unless the structure to be used in the new design conformed to the highest type of present-day practice, the structure was abandoned or replaced. As a result, the new plant is modern in every detail and capable of purifying and softening the highly contaminated water of the Ohio River efficiently and economically.

Deficiencies to Be Corrected

This interesting program was initiated in November, 1934, when the Burns & McDonnell Engineering Co. submitted a report to the city of Cincinnati outlining the results of studies of the problems involved. These studies brought out the deficiencies of the existing works and provided the groundwork for the plan later adopted and now being completed. Chief among the deficiencies of the old plant were:

1. Lack of proper pre-treatment facilities
2. Inadequate chemical-handling equipment
3. Limited water passages, seriously affecting the capacity of the plant
4. Lack of capacity to meet the growing needs of the city for additional water

The original Cincinnati plant was put in operation in 1907. The design of these works was an outstanding engineering achievement, considering the fact that the plant was the second major rapid sand filter plant constructed in the United States. At the time much stress was placed on the function of the filters themselves in such a plant. Little information was available, and practice had not been developed concerning the proper method of preparing the water for the filtering process. Chemicals were applied to the raw water with little or no provision for mixing them properly, or for the development of proper flocculation and sedimentation. Water softening was virtually unknown. The Cincinnati plant reflected all these conditions and, quite naturally, in 1935 it was far behind modern practice in the art of water purification.

The chemical-handling facilities in the old plant were awkward and costly to operate. Lime and sulphate of iron were delivered in bulk, sacked and stored. Feeding was accomplished by trucking the sacked chemical to the solution tanks, or slakers, by hand, and dumping the sacks at regular time intervals denoted by a signal bell. Both lime suspension and sulphate of iron solution were transported by pipes a distance of over 500 feet to the points of application.

The nominal capacity of the old plant was 112 mgd. However, tests conducted in November, 1934, indicated that it was impossible to serve the filters through the sedimentation basins, as originally planned by the designers, at a rate exceeding 80 mgd. At 90 mgd, by-passing the basins affected the condition of the applied water, and at 100 mgd the preliminary treatment had to be entirely eliminated in order to get water on the filters. Inadequate capacity of by-pass lines between the basins and between the basins and the filters, together with complicated gate structures, was responsible for this deficiency.

The nominal capacity of the old plant, 112 mgd, was computed on the basis of 28 filter units, at 4 mgd each. During the summer of 1934 demands as high as 135 mgd were imposed on the plant, thus requiring a severe overloading of the filters, considering the fact that at this rate

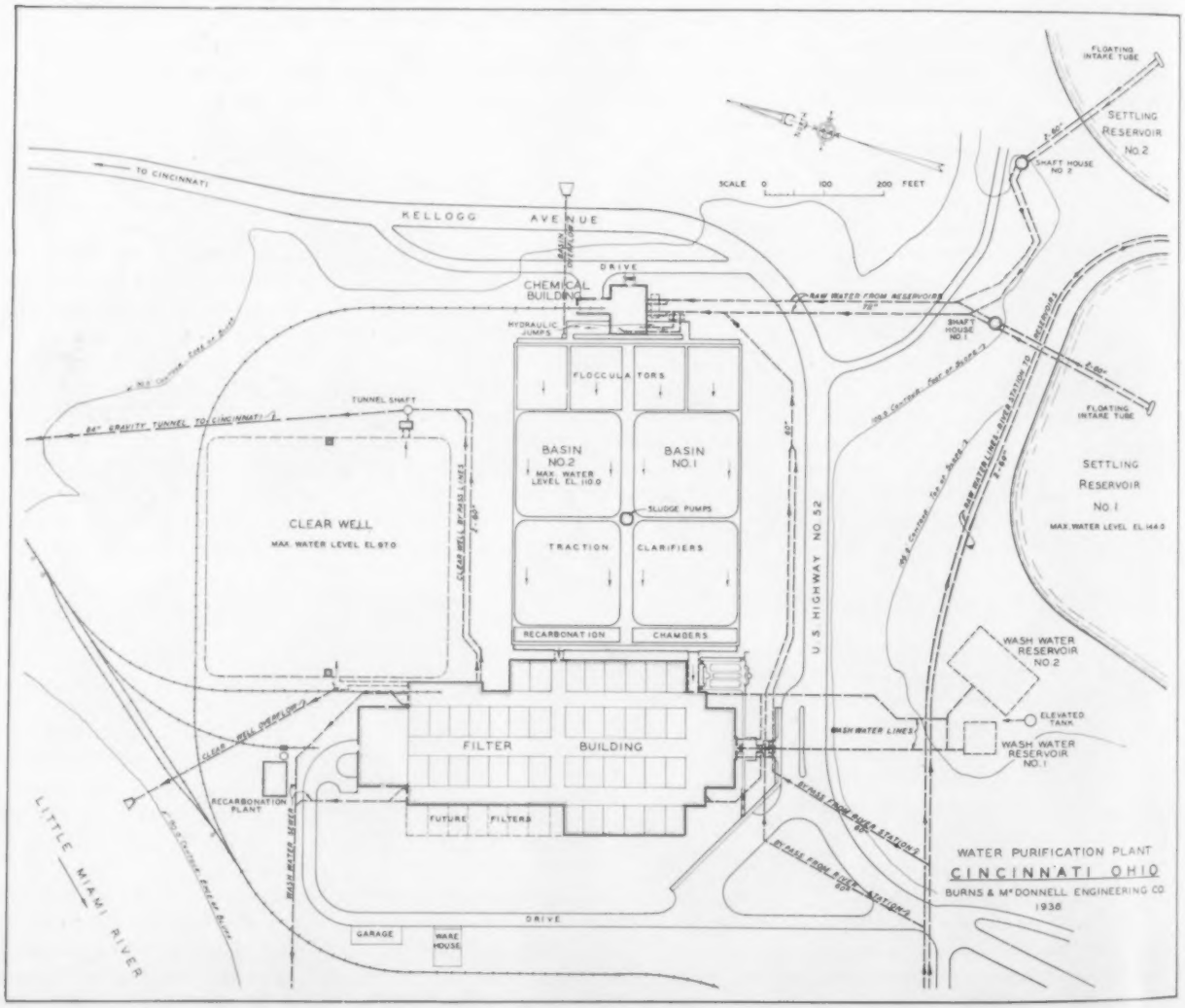
adequate pre-treatment was impossible. With the definite prospect of still greater loads in the future, the condition of the plant presented a serious problem requiring immediate attention.

Rehabilitation Planned

Conditions favored the rehabilitation of the existing works rather than the establishment of a supplementary plant. Such a supplementary plant, if located far from the existing works, would require a new and costly intake, low-service and high-service pumping stations, and long transmission mains. Because of the scarcity of satisfactory intake sites along the Ohio River in the vicinity of Cincinnati, the new works would necessarily be upstream so far that they would be unfavorably situated to supply the city properly and economically. Supplementary works in the vicinity of the existing plant could have been built on high ground south of the present location, but the higher elevation required special low-service pumping equipment and complicated means of delivering water to the existing high-service station. Locations immediately adjacent to the existing plant could not be considered because of lack of room and inadequate foundations. Thus it was that the possibilities of reconstructing the existing works and adding to them in such a way as to make a new and modern plant were forcibly brought to the attention of the designer.

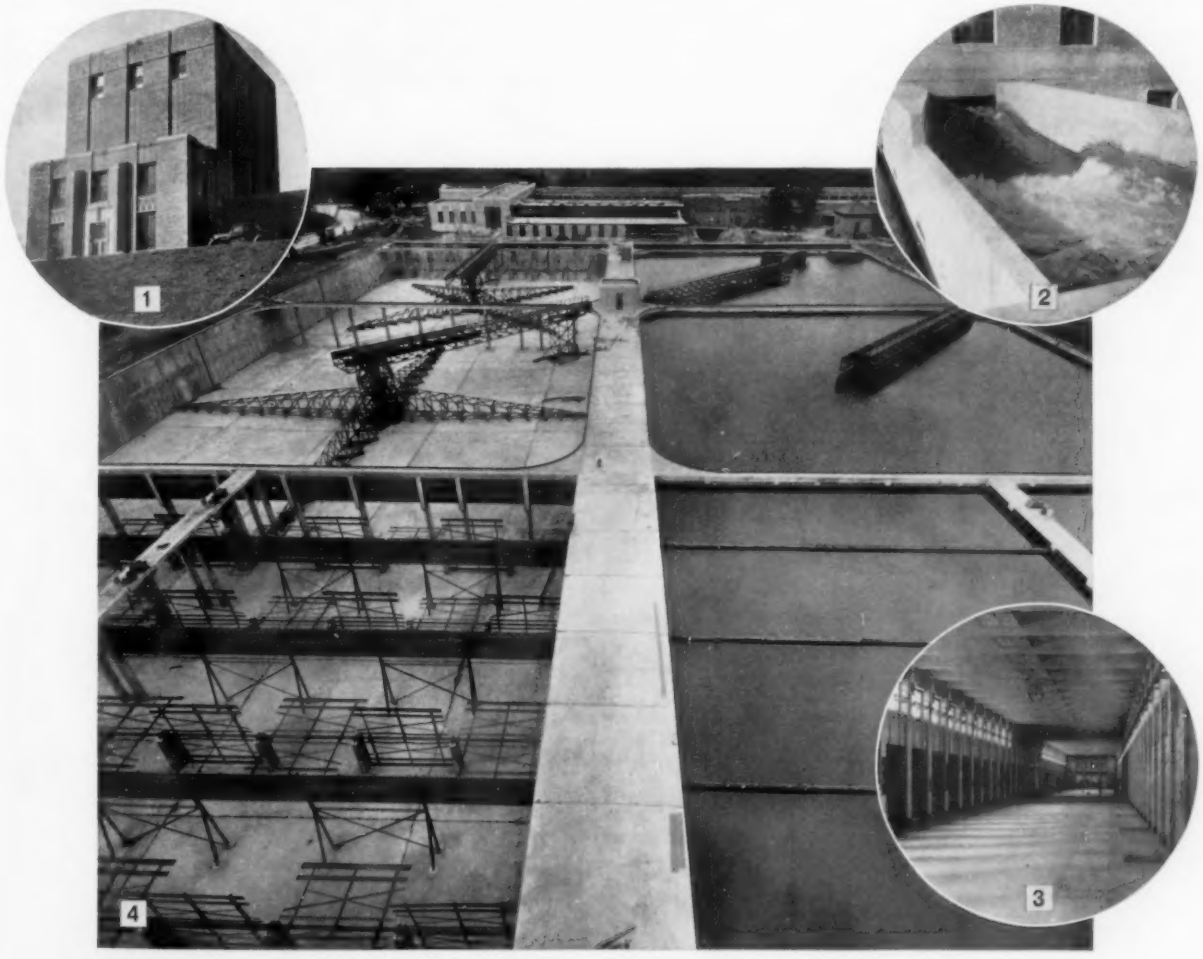
Careful consideration of this plan disclosed a number of favorable features. The plan permitted the new works to operate satisfactorily in connection with the existing intake, low-service station, gravity tunnel, and main high-service station. The large settling reservoirs could still be retained as a valuable part of the new plant, and provided excellent coagulation and sedimentation facilities temporarily during the removal of the old coagulation basins and the construction of new basins. The existing filters were found to conform closely in both horizontal and vertical dimensions to modern units. The manifold system beneath these units was found to be in excellent condition and of an ample capacity. By installing new underdrains, sand and gravel, and rebuilding the wash-water troughs, these units could be made to conform exactly to modern ideas of what rapid sand filters should be. The existing headhouse, while poorly arranged and out of date, was adequate in size and well located. Much of the existing wash-water system and some of the drain facilities were found useful in the scheme of rehabilitation.

The plan finally developed provides for new transmission mains from the settling reservoirs to a new and completely modern chemical building. Water wheels in



LAYOUT OF THE NEW WATER PURIFICATION PLANT NEARING COMPLETION AT CINCINNATI, OHIO

this building reclaim the potential energy in the water as it passes from the high level of the settling reservoirs to the flow-line level of the plant proper. From the water wheels the water flows to hydraulic jump mixing flumes constructed as a connecting link between the chemical building and the coagulation basins. Chemicals are applied to the water at the head of the mixing flumes on its way to the Flocculator compartment of the coagulation basins. These basins are constructed in two units on the site of the old basins. In addition to the space for flocculation, they each contain two traction type clarifiers arranged in tandem, followed by a recarbonation space. Two large flumes convey the water to the filter. Twenty-six of the old filters were used in the new scheme, with the addition of fourteen new units. New operating galleries were constructed along the back of the old filters, which were reversed and served from these new galleries. The new filters are constructed on the outside of the new galleries.



IMPROVEMENTS IN THE WATER PURIFICATION PLANT OF CINCINNATI

1. The new chemical building. 2. The hydraulic jump mixing flume carrying a flow of about 80 mgd. 3. Filter Gallery B, looking south. 4. The settling basin, showing the Flocculator equipment and clarifiers

Penstock Lines

The new transmission mains serving the chemical building from the settling reservoirs are referred to as "penstock lines," and quite properly so because they serve waterwheel generator units. Each of these lines is connected to the settling reservoirs by means of two 60-inch branch lines passing through control valves at the shaft houses and terminating in the reservoirs in intake tubes originally designed to permit drawing water from different levels of the basin. At the chemical building the lines are each connected into the water wheels through a venturi meter and a 60-inch gate-valve. Back of the 60-inch gate-valve a 36-inch line branches off the main line and is so arranged as to by-pass the water turbine. Controlling this line is a 36-inch cone-valve located between two 36-inch gate-valves. Both penstocks are identical in so far as the foregoing items are concerned. The west penstock, in addition to these provisions, has a direct connection to the river pumping station, which permits the complete by-passing of the settling reservoirs. In addition, two 48-inch lines are connected to this penstock in such a way as to allow the complete by-passing of the turbine units and the tail-race conduit serving these units. The penstocks between the venturi meters and the branches leading to the settling reservoirs are 72 inches in diameter, constructed of $\frac{5}{8}$-inch steel plate pipe, coupled in 40-foot lengths by means of Dresser couplings. Special provisions are made to anchor the lines and provide proper air relief during either the filling or emptying of the lines. All new valves in these lines are flanged on one end, and have Dresser couplings on the other end.

Chemical Building

The chemical building is a brick, steel-frame structure supported on concrete piling. The main building is 60 x 80 feet in ground plan and houses the water wheels, electric generators and switching equipment, chemical-handling equipment, and eight chemical storage bins which are built into the building frame.

Each bin has a capacity in excess of six carloads of chemicals, making a total storage capacity for the plant of over fifty carloads.

Extending throughout the length of the basement is a low-pressure concrete conduit 10 x 15 feet in cross-section. This conduit receives the discharge from the turbines and the turbine by-pass lines. At the west end the conduit leads to the rising well which serves the head end of the hydraulic jump mixing flumes.

Chemical-Handling Equipment

Chemicals received at the plant are unloaded from the cars by means of air conveying equipment which lifts the material to the storage bins. The equipment is designed to handle quicklime, alum, sulphate of iron, soda ash, or any granulated or small material up to 1- and 1½-inch in size. The Brady air conveyor discharges through the receiver tank to a screw conveyor mounted on a pivot in such a manner that the discharge spouts of the screw conveyor may be moved over any of the eight storage bins as required. The chemical is taken from the bottom of the bins by means of high-speed apron conveyors and delivered to the batch bins of the chemical feed machines. Each chemical feed machine is served by two bins, and each bin may serve two machines. The Omega machines are of the gravometric type, controlling the feeding of chemicals by weight rather than by volume. Solutions from the machines are transported through Goodrich rubber pipe, to the head of the hydraulic jump mixing flumes, and there applied to the raw water through troughs lined with Goodrich 3/16-inch Triflex rubber. Lime suspension travels less than 40 feet from the slakers to the point of application. Normal sulphate of iron and soda ash solution travels a maximum of 60 feet to points of application. Alum may be applied to the head of the mixing flumes or may be pumped to a point 1,600 feet distant and applied to the raw water on its way to the settling reservoirs. Thus, during periods of high turbidity, double coagulation may be utilized. Soda ash may be applied as after-treatment at the entrance to the clear well. Means of applying activated carbon is included in the design. There is separate storage room in the chemical building for this material, and points of application at the head of the hydraulic jump and just ahead of the filters are provided. Ammonia and chlorine will be restricted to application after filtration, although pre-treatment with either at the chemical building is possible, merely by the installation of feeding apparatus.

Water softening is contemplated to control the periodic hardness due principally to sulphates in the water. Soda ash and quicklime may be applied for this purpose in the quantities required. Final control of the softening reaction is provided by the application of carbon dioxide at the end of the coagulation basin.

Coagulation Basins

The coagulation basins are preceded in the operating sequence by the hydraulic jump mixing flumes, each having an operating capacity of approximately 125 mgd. The basins themselves are in duplicate, each basin is 175 feet wide by 503 feet long and 20 feet normal water depth. The capacity of both basins is 26.4 million gallons, providing a theoretical retention period of 3 hours and 15 minutes when operating at 200 mgd.

The side and end walls of the basins are of the conventional buttressed design, backed up by earth fill. The center wall is a cellular structure 20 feet wide, filled with broken concrete ballast, supplied by the wrecking of the division wall between the old basins. A tunnel extends throughout the length of the new division wall, providing convenient space for electric conduits, chemical lines, basin flushing mains and sludge drains. The base of the division wall under the basin floor is constructed with inspection galleries running the entire length of the wall on each side, which permits visual inspection for any leakage from the basin that might endanger the wall. The wall is more stable against overturning than the usual gravity type wall that might be employed for the purpose, contains about one-half the concrete required for the gravity wall and has a greater coefficient against sliding and costs less.

Flocculation is provided by means of four rows of Dorr Flocculators in each basin. The units are 16 feet in diameter, are of all-steel construction, driven through gears and shafting by means of electric motors. The speed of rotation is controlled by means of variable speed reduction gears and permits a range from 0.6 rpm to 1.8 rpm. This provision was made in view of the fact that merely coagulating and clarifying the water requires a different speed of rotation than when softening is employed.

Following the Flocculators are two traction type clarifiers, each removing the accumulated sediment from an area 175 feet square. These units are the largest of their type yet constructed. Sludge swept to the center of the clarifiers is removed by means of four diaphragm pumps located in the small pump-house constructed on the division wall of the basin.

At the end of the basins are the recarbonation spaces providing for approximately twelve minutes' theoretical retention. Carbon dioxide will be introduced into the water through a grid constructed of Transite pipe mounted 12 feet below the water surface.

Filter Building

As previously indicated, the old filter building is being reconstructed by adding new operating galleries along the back wall of the old filters, and adding new filters on the outboard side of the new galleries. In this manner the new galleries will accommodate 47 units, 40 of which are now being constructed. Extension of the filter house into the space now occupied by the old chemical building would permit the installation of at least 12 more filters. Thus, filter capacity of 200 to 250 mgd is possible on the basis of conventional ratings.

The old units are being thoroughly reconditioned by the addition of new wash-water troughs, new sand and gravel, and new cast iron underdrains. The manifold pipe system under these units is retained, but is reversed to operate from the new galleries.

The new filter units differ little from the old reconstructed units. Nine wash-water troughs are installed in the new units, while there are only eight in the old filters.

The new units have large pressure conduits beneath the filter floor, rather than a manifold pipe system.

All units are serviced with motor-operated wedge type gate-valves and Builders Iron Foundry rate-of-flow controllers. All valves, controllers, fittings, etc., are housed in the large and roomy pipe galleries, permitting ready access and replacement. The wash-water pumps are housed in the front cross gallery. The existing wash-water reservoirs are retained and supply the filters through separate lines serving each of the galleries.

The head house is divided into an entrance lobby, laboratory suite and office suite. Laboratory facilities are unusually complete. A small lecture room is provided, accommodating fifty to sixty persons. Offices and laboratories are completely air-conditioned and air-cooled in the summer.

Electrical System

Cincinnati's new water purification plant has the distinction of being the only plant yet built that is completely electrically operated. Most of the power used will be generated by means of a small hydroelectric installation consisting of two 175-kw water-wheel generator sets. This installation is connected to the system of the Cincinnati Gas & Electric Co. and will operate under an interchange agreement. Deficiencies will be supplied by the power company, and surplus will be taken by them. The wicket gates on the water wheels will be set to pass the exact amount of water required by the filters. Thus changes in plant load will not affect the operation of the generators or the water wheels. By keeping the flow of water constant, the chemical treatment may be kept relatively uniform.

Electrical equipment in the chemical building includes the motor-operated air conveyor system, freight elevator, and chemical feed machines. Flocculators, clarifiers and sludge pumps, all motor-driven, serve the coagulation basins. In the filter building the wash-water pumps and air-conditioning equipment are the main items of electric load. All valves, valve position indicators and gages are electrically operated.

The panel boards serving the filters carry electrically operated rate-of-flow and loss-of-head gages. Control switches and signal lights are also mounted on these panels. Wash-water rate-of-flow is indicated by large electrically operated gages mounted overhead in the gallery. All information, such as the level of basins, reservoirs, temperature of water, air temperature, total flow of water, etc., is centralized by means of electric gages on a large board in the general office.

Personnel

The improvement program has been under the general direction of A. S. Hibbs, Superintendent of Water Works. PWA participation is being supervised by Paul S. Maline, Chief Resident Engineer Inspector. The Penker Construction Co. and the Folwell Engineering Co. are the general contractors. Plans, specifications and supervision of construction have been supplied by the Burns & McDonnell Engineering Co. under the personal direction of the author.

The Governments of the City of Atlanta and Fulton County, Georgia

An Important Report by the Consultant Service of the National Municipal League

A COMPREHENSIVE report on every department and activity of the governments of the city of Atlanta and Fulton County, Georgia, has recently been made by the Consultant Service of the National Municipal League, of which Dr. Thomas H. Reed is Director. The Atlanta situation is unique in that the city is situated in two counties—Fulton and DeKalb—and the state constitution forbids consolidation in such an instance. It was therefore necessary to devise some other plan for the solution of this complicated metropolitan problem by provisions for unified treatment of health activities, hospitals, welfare, parks, recreation, and police and fire.

The report is also unique in that it includes a discussion of both the city and county school systems, which, though located side by side and serving very similar population groups, differ radically in their methods of selection of boards of education, in administration, educational offering, teachers' salaries, etc.

The report points out the curious anomaly of a mayor with more legislative than executive power. It probes vigorously into the unhealthy status of the city taxpayer who pays not only the total cost of city government but five-sixths of the total of all money expended by the county in supplying local government services in the area outside the city. It comments caustically that the city and county governments are "headless," being conducted by committees rather than by any executive head. It suggests ingenious remedies for many of the peculiar evils of the local situation. During this searching analysis the proper impartial and scientific attitude is carefully maintained which is so tremendous a factor in the impression such a report can make on those officials and citizens who are in a position to give the greatest value to its findings by their careful consideration.

The report consists of two volumes. Volume I (161 pages) contains the general conclusions concerning governmental changes in both city and county, and recommendations for consolidation of certain departments, together with a summary statement of findings and recommendations relative to each of the departments of the city and county. Volume II (619 pages) contains a series of 25 special reports covering in detail all the more significant activities of both the city and the county, including education. The second volume closes with the results of the study of personnel, a classification of employments and a schedule of minimum and maximum salaries for practically all positions of the city and county except those compensated on a daily or hourly basis.

Both volumes are copiously illustrated with charts and tables. An enabling constitutional amendment, giving home rule to Fulton County, an act providing for a metropolitan planning commission, and other legislative measures appear incidentally in the course of the report.

The survey was made for the Board of Commissioners of Fulton County, the Mayor and Council of the city of Atlanta, and the Atlanta Chamber of Commerce, who together employed the Consultant Service and shared the expense. The Chamber of Commerce has published the report. (See page 139.)

The Water Works of New Orleans, Louisiana

The Crescent City Is Host to the 58th Annual Convention of the American Water Works Association, April 24-28, 1938

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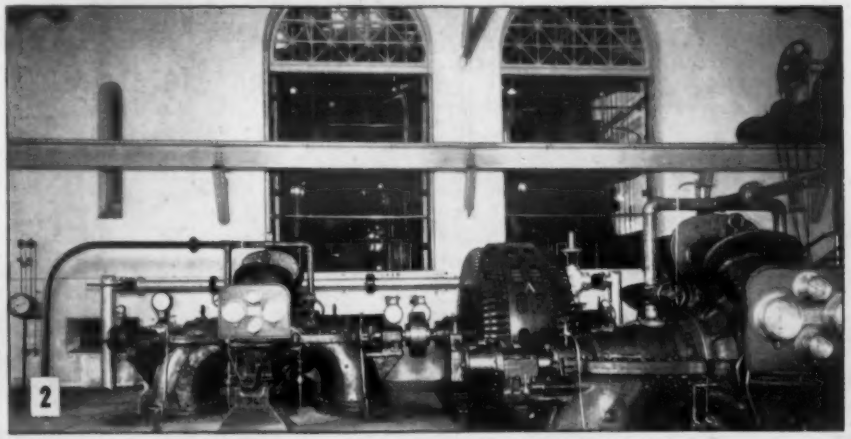
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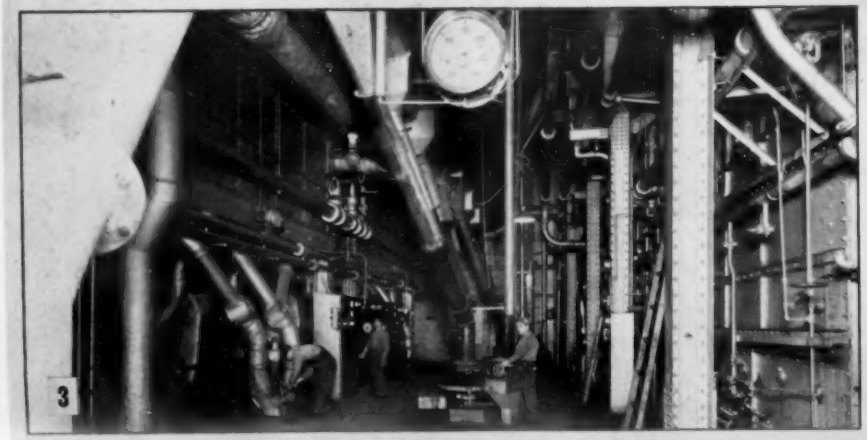
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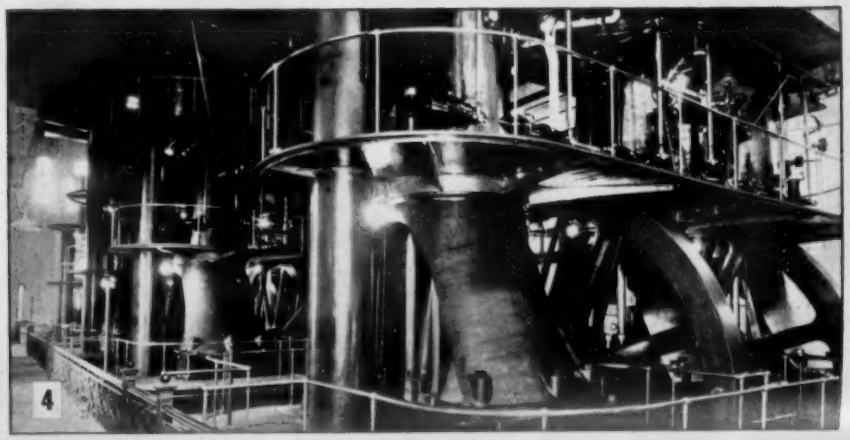
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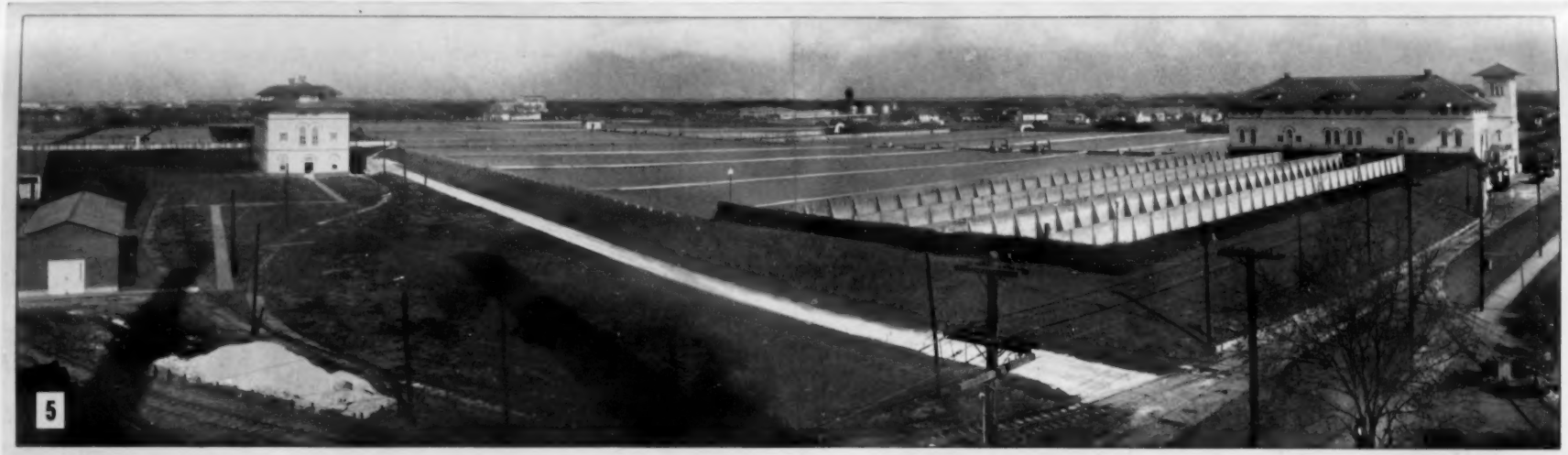
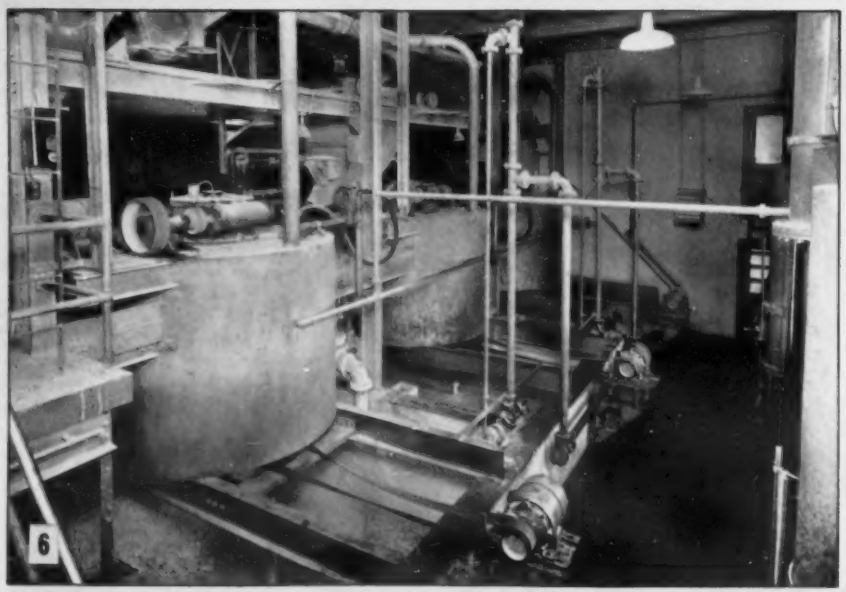
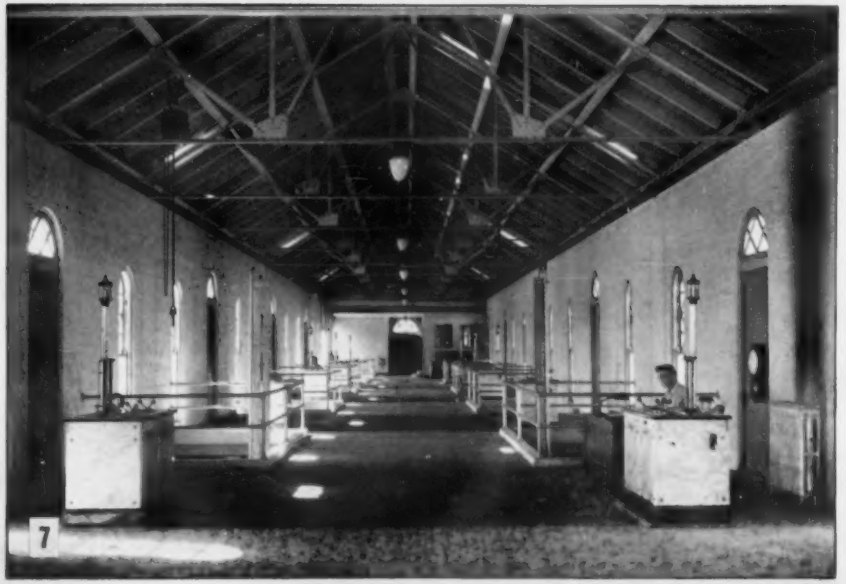






Photographs by Charles L. Franck through courtesy of Sewerage & Water Board of New Orleans

.. Exterior view of the Main High-Lift Pumping Station and the Turbine Room; the latter in the right background. 2. Interior of the High-Lift Pumping Station, showing the two 40-mgd electrically-driven high-lift centrifugal pumps. 3. Boiler room at the Main Water Works Pumping Station, showing the feeding of pulverized coal to the boilers. 4. The vertical triple expansion high-lift pumping engines at the Main Pumping Station. 5. General view of the Purification Plant, the old Head House in the right center, and the new Chemical House in the left background, with the reservoirs in the center. 6. Interior of the New Chemical Building, showing the lime slacking tanks. 7. Control tables for the battery of filters

Sewage Treatment at Hot Springs, Arkansas

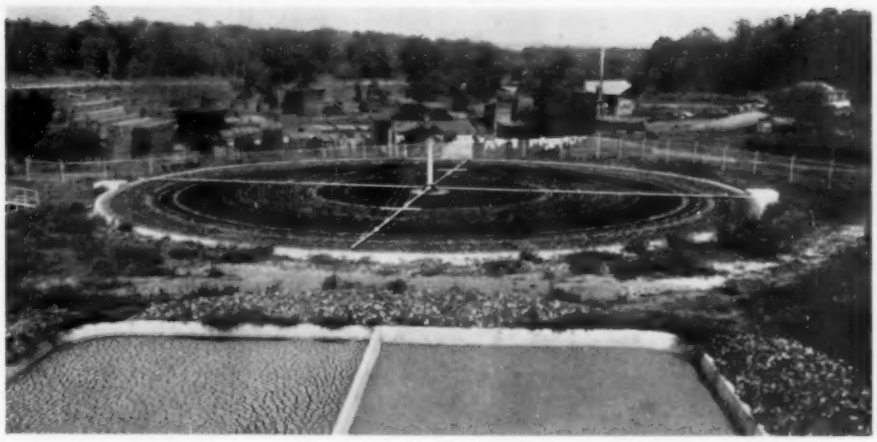
High Temperature of Sewage and Contour of City Create Unusual Conditions

By THEODORE REED KENDALL
Engineering Editor, THE AMERICAN CITY

THE world-famous medicinal baths of Hot Springs have created somewhat of a problem in sewage treatment, owing to the high temperature of the sewage due to hot baths and the constant flow of hot spring water to the sewers, and the mineral character of the medicinal spring waters. The cure has been the construction of two sewage works—the South or larger plant with activated sludge treatment, and the Gulpha plant with settling and sprinkling filter. Both have separate sludge digestion with waste burning of the gas.

The need for sewage treatment in any large inland city is axiomatic, but add to that an unusually large proportion of hospital and semi-hospitalized treatments, and the need is obvious. Hot Springs, however, had no sewage treatment until an outside activity with which it had no connection made it imperative. The creation of two large lakes below the city on the two streams that receive the sewage of the city started the movement for sewage treatment. These lakes were created by the Arkansas Power and Light Co. to furnish hydro power, and soon afterwards the wooded shores of the lakes began to be populated with summer dwellings of Hot Springs year-round residents. The untreated sewage from the city flowed down Gulpha Creek to Lake Catherine, and down Hot Springs Creek to Lake Hamilton, and caused some thought on the part of those who would use the lake for bathing and fishing. Thus

THE SOUTH SEWAGE-TREATMENT PLANT OF HOT SPRINGS, ARK.
1. The pattern in the aeration tank. 2. The brick digester with floating cover. 3. The double effluent weirs



THE ROTARY DISTRIBUTOR AND SLUDGE DRYING BEDS AT THE GULPHA PLANT, HOT SPRINGS, ARK.

the movement for proper treatment of the sewage began, resulting in a PWA project which was completed in June, 1936, furnishing the city with two well-designed plants that are producing satisfactory effluents for delivery to the two creeks.

The South Plant

The South Plant serves a population of about 25,000, not including transient visitors. A 24-inch cast iron line delivers the sewage from a vitrified clay line higher up in the system, and it first passes through a channel which is in fact a double weir set for overflow at the capacity of the plant, 3.5 million gallons. A Chicago comminutor operated by a float switch starts when the sewage rises because of the clogging of the screen section of the comminutor by rags or other solids. The comminutor when started shreds the material so that it will pass through the screen section quickly. A hand-raked bar screen is provided in case it is necessary to take the comminutor out of service for any reason.

The sewage flows through the pump-house to the primary settling tank, equipped with a Chain-Belt Rex sludge collector. The tank is in two sections, each with a sludge collector. The plant is also built in duplicate for aeration, which is remarkably effective, producing not only the typical brown activated sludge but in large, heavy flocculent particles. Carborundum diffuser plates are used in the aeration tanks.

Looking into the settling basin, one gets the first shock in the operation of the plant. The surface of the sewage is constantly broken with large bubbles of gas seemingly showing septic action. But there is no odor. The sewage is so warm that it starts to form gas in the sewers long before it reaches the plant, but there is no evidence of hydrogen sulphide, apparently because of the other chemicals in the waters entering the sewers which inhibit the formation of the H_2S or else convert it into some inodorous gas.

The aeration of the sewage is done with one cubic foot of free air per cubic foot of sewage. The aerated sewage enters the settling tank, where the heavy flocculent sludge settles out quickly. The settling-tank floor is about 2½ feet higher than the activated sludge tanks, so that as the sludge is brought to the end of the tank by the Rex sludge collector it flows readily by gravity to the activated sludge tank running along the side of the aeration tanks. From this tank the sludge is drawn constantly by a pump in the pump-house and delivered to the incoming sewage.

Twice a day the operator draws off a tankful of the activated sludge to a separate settling tank, and when it has settled the supernatant liquid is pumped off to the incoming sewage, and the sludge to the digester.

The effluent from the final settling tanks runs out over double rectangular weirs to the channel of Hot Springs Creek, through which it flows 1½ miles to Lake Hamilton.

The digester is 50 feet in diameter and has a capacity of 40,000 cubic feet. It is equipped with a Downes floating cover, and the gas from the digestion of the sludge is wasted through a waste-gas burner. The digester is built with a heating coil, but the high temperature of the sewage at all times and the consequent heat of the sludge has made its use unnecessary. There is therefore no circulating pump or heater for the digester coil water.

The digested sludge is drawn off regularly to the four sludge beds with concrete walls and measuring 151 x 38 feet each. It was planned to use the sludge locally for the improvement of gardens and parks, but the unfortunate occurrence that has inhibited the use of sludge in so many communities also happened here. The first sludge drawn was not completely digested and hence had a very bad odor, and the spreading of it on a park lawn created a resentment that will take long to overcome in the community.

In the small basement of the pump-house are located an Ames 435-gpm centrifugal pump for recirculating the activated sludge. Next to it is a Chicago 200-gpm centrifugal, also with a Westinghouse motor, for pumping the excess activated sludge to the settling tank and the heavy settled sludge to the digester, as well as the supernatant liquid to the incoming sewage. Beyond these are two Chicago raw-sludge pumps of 400 gpm, each working through a Telechron clock control which starts them every 20 minutes pumping raw sludge to the digester. An Economy sump pump with both float and hand control takes care of the building drainage. In the basement also are located a PFT pressure regulator and a PFT flame trap between the digester and the waste-gas burner. A small Goulds pressure pump with a small supply tank is installed in the basement to supply gland water to the motors if the city water supply should fail, but this has been disconnected.

On the main or ground floor of the pump-house are located the control switches for the entire plant, as well as the three Roots-Connersville blowers with Westinghouse motors and a Westinghouse line starter for furnishing the air for activation. An outside air filter removes dust and

dirt from the air so that the diffuser plates will not become clogged. On the ground floor also is a small laboratory for stability and other routine tests. It is heated in winter by a small digester gas burner, the only use that is made of the gas from the digester.

The Gulpha Plant

The Gulpha plant at Hot Springs serves a population of only 4,000, but it is the harder plant to operate because of the type or character of sewage received. It serves the hotel and hospital district, where matches are thrown promiscuously into toilets by patients or by maids cleaning rooms; these matches have a way of getting all through the Gulpha plant, even into the distributor, passing a reasonably fine screen installed to catch them. This makes the operation of the distributor unsatisfactory unless the holes are cleaned at least once a day, and more often would be better.

A 10-inch line delivers the sewage to a float-controlled Chicago comminutor, and thence it flows to a 40 x 10-foot settling chamber equipped with a Link Belt sludge collector. The flow is then through a fine screen installed to intercept the matches, and on to the dosing chamber of the distributor. The dosing chamber is equipped with a PFT siphon which intermittently applies sewage to the bed through the 108-foot diameter Dorr rotary distributor. The stone in the filter is 6.5 feet deep. Because of the slow rate of flow of the sewage through the distributor, since so many of the holes are clogged, owing to a lack of sufficient maintenance personnel, the dosing chamber continues to fill at a slightly lower rate than the sewage is applied. This keeps the rotary distributor going most of the day, but the flow at night is practically nil, so that the filter has a rest from about 10:00 to 7:00. The slow application, and constant application with unequal distribution due to the clogging of the holes, does not seem to have any deleterious effect on the character of the effluent. If the flow should increase materially to the real capacity of the plant, some trouble might be expected.

The trickling filter effluent flows to a secondary settling basin 30 feet in diameter with a Dorr Sifeed clarifier. The effluent is highly nitrified. The average flow at the plant is about 300,000 gpd, and the overflow weir is set for a flow of 500,000 gallons.

A Chicago 400-gpm centrifugal pump with a Westinghouse motor pumps the raw sludge to the 24-foot diameter sludge digester with a Downes floating cover. A 200-gpm Fairbanks-Morse pump at the secondary settling tank is operated automatically to deliver the secondary sludge to the digester. The small house covering the comminutor also contains the pumps, a Wallace & Tiernan chlorinator for prechlorination if needed, and a PFT flame trap between the digester and the waste-gas burner.

Two small sludge beds are used to dry the well-digested sludge.

The two sewage-treatment plants in Hot Springs are operated under the direction of C. A. Wilson, Superintendent. The plants were designed and placed in operation by Black and Veatch, consulting engineers, Kansas City, Mo.

Building-Code Revision Urged

DRASTIC revision of antiquated municipal building codes, some of which are more than twenty years old, is urged as a stimulus to better housing through the reduction of excess construction costs by D. Knickerbacker Boyd, fellow of the American Institute of Architects. Mr. Boyd's recommendations are contained in a report issued by the Committee on Public Information of the Institute, which holds its seventieth convention in New Orleans, April 19 to 22, with housing as the principal topic.

"In an almost unbelievable number of cities," Mr. Boyd reported, "building codes are now in operation which were prepared ten to twenty years ago and have not been revised or amended since. These codes fail to take into consideration the advances made in the scientific and efficient use of structural materials. In all such codes numerous changes could be made which would in the aggregate reduce building costs while still retaining safe structural requirements." This condition exists, Mr. Boyd stated, in face of a "housing-conscious nation," stimulated by the possibilities of improving the living conditions of their citizens and their community aspect by slum clearance and the erection of new low-cost homes.

The appeal was directed to members of the American Institute of Architects to inaugurate movements to modernize cumbersome and useless building codes throughout the United States.

"Municipal officials, with proper technical guidance, can sponsor codes that will enable them to take advantage of the vast field of accumulated data and to effect justifiable economies in construction and in plan requirements," Mr. Boyd suggested. "Principal sources of this information have been governmental departments or technical institutions. But some material manufacturers, through an enlightened spirit of cooperation in ascertaining and presenting reliable and informative data on their products, have also contributed to their more intelligent and economical unit utilization, and therefore increased total sales."

Mr. Boyd pointed to regulations relating to wall thickness as one of the items in need of complete revision. "An investigation of 100 building codes throughout the country by the Department of Commerce Building Code Committee, brought the recommendation for 8-inch walls of brick, hollow tile or concrete block. The investigation disclosed that in some cities it was possible to construct a two-story dwelling with 8-inch walls for both stories above the basement, while in a neighboring city—less than ten miles away—12-inch walls were required throughout. Why should the thicker wall be required for both stories in 19 cities and for the first story in 31 cities, if the 8-inch wall is equally safe and approved by 28 cities, the latter among the largest in the United States?"

Mr. Boyd calculated that in a house 20 x 30 feet, two stories high, 12,500 bricks could be saved by using an 8-inch wall instead of a 12-inch wall.

"Those extra bricks would mean that from $200 to $225 has been added to the cost of the house for the brick alone, to which $150 must be added for the cost of the mortar and for the extra labor cost of the bricklayers and helpers. This would mean that a house of the same outside dimensions would cost from $350 to $400 more in Albany or St. Louis than it would in Pittsburgh or Seattle.

"In addition to the safe structural requirements and money savings, the thinner wall increases the area on each floor by about 30 square feet. A small bathroom or several large closets could be added to each story."

New 4-MGD Filtration Plant and Pumping Station at Decatur

By J. E. JAGGER
Vice-President and Chief Engineer, Alabama Water Service Company

WITHIN one year of attaining an age of half a century, the old water-works pumping station at Decatur has recently been replaced by a modern filter plant and pumping station having a capacity of 4 million gallons daily. The water-works system in Decatur is one of 32 in Alabama owned and operated by the Alabama Water Service Co.

Old Pumping Plant

The original plant, constructed during 1888 and 1889, was designed for direct pumping from the Tennessee River into the distribution system, and in order to install pumping machinery within practical limits of suction lift during the lowest stages of the river, the pump-house was constructed as a deep circular pit 54 feet in diameter, the floor level being about 15 feet below ground level. From a suction well, excavated into solid lime-rock below the floor, a 30-inch diameter intake line extended about 800 feet out into the river. Gate-valves on the pump-house end of this line were closed during high river stages to keep the plant from flooding, and partially opened to admit water for pumping. Large flows from springs within the pump-house area, however, made this almost unnecessary, since they furnished a sufficient supply. In fact, pumping equipment was operated continuously to pump this inflow to waste, during high stages of river, when the rate of inflow from the springs was greatly increased. The original steam pumps, installed in 1888, had been supplemented with electrically driven pumps, but steam was maintained as a standby during flood stage whenever the river rose to the plant-floor level.

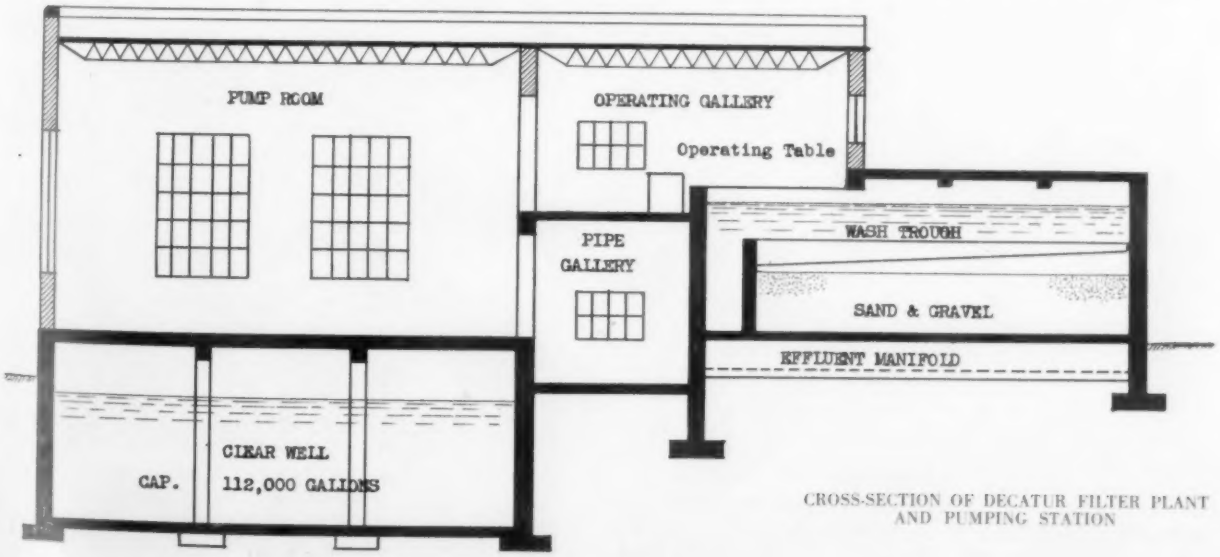
Normal low water at Decatur was at Elev. 534, and the floor of the old plant was Elev. 546.8. Flood stages of the river approximated Elev. 558, nearly 12 feet above the pump-room floor.

In 1934, the Tennessee Valley Authority began construction of Joe Wheeler Dam on the Tennessee River about 26 miles downstream from Decatur, and the normal level of Wheeler Pool is about Elev. 556, with Elev. 558 set as the maximum expected flood stage. This pool level being approximately 9 feet above the old pump-house floor, made it necessary to relocate the pumping equipment, and it was decided to construct an entirely new pumping station and filter plant to replace the existing four half-million-gallon wood-tub filters then in use.

Dual Raw Water Stations

There are two raw water stations, serving the new plant, one making use of the 30-inch intake line previously mentioned, and the other constructed about 130 feet out from the shore of the lake. The former is referred to as Raw Water Station No. 2, and the latter as Raw Water Station No. 1. At the outer end of No. 1 Station are removable hand-cleaned trash racks, and behind the racks are ½-inch mesh screens in steel frames, also removable. Water is admitted into the structure through a 30-inch gate-valve which may be closed when it is desired to dewater the plant for pump inspection.

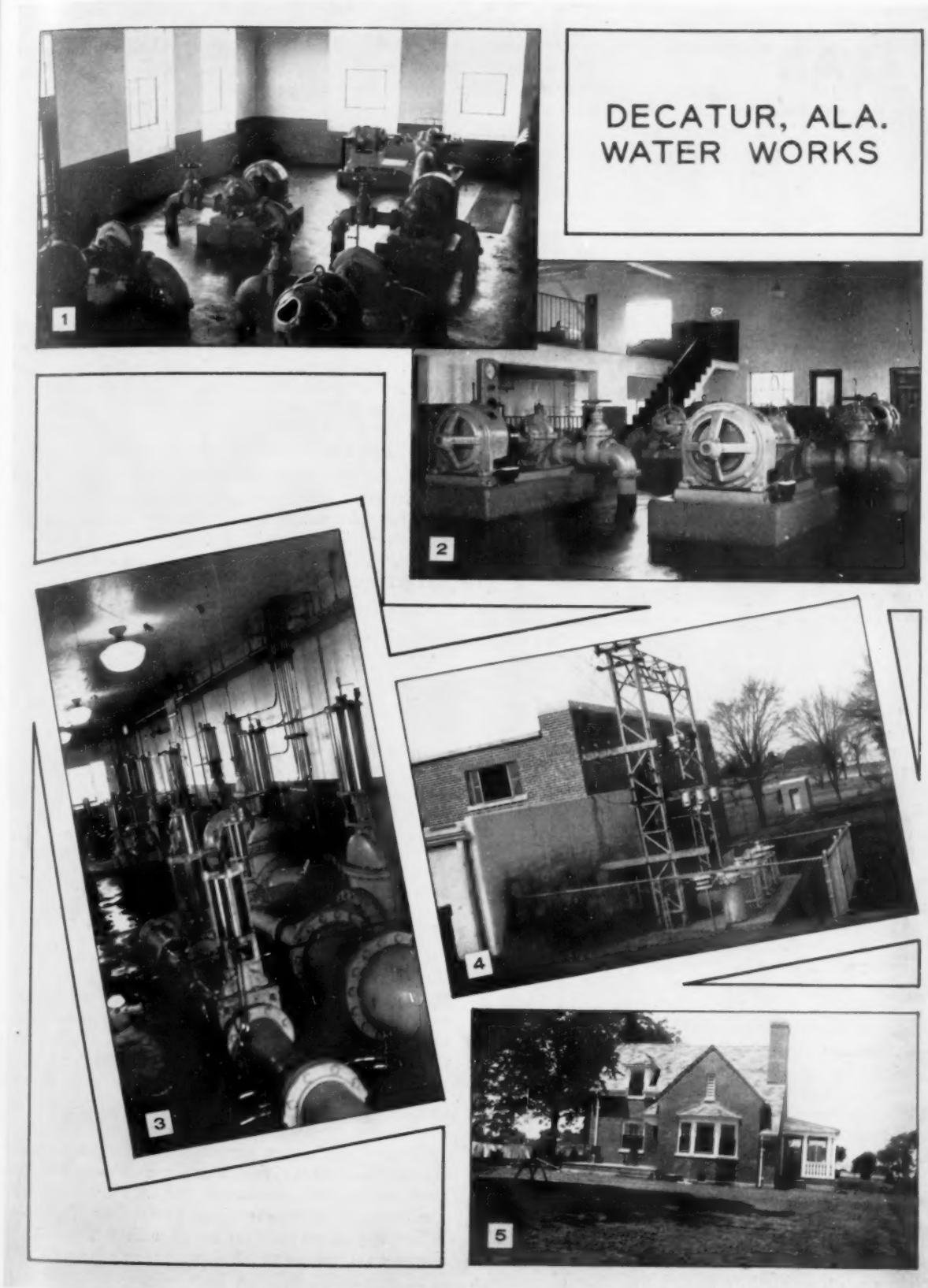
Raw Water Station No. 1 is equipped with two Pomona turbine type pumps, each having a capacity of 2,100 gpm



CROSS-SECTION OF DECATUR FILTER PLANT AND PUMPING STATION

THE NEW PUMPING AND FILTRATION PLANT, DECATUR, ALA.

1. Raw Water Station No. 1. 2. Raw Water Station No. 2. 3. The chemical house and settling basin. 4. Cleaning a settling basin; note perforated stilling wall. 5. The main pump station and filter building. 6. The filter operating gallery



INTERIORS AND OTHER FEATURES OF THE DECATUR PLANT

1. The pump-room, showing the control panel at the right. 2. Another view of the pump-room with the pipe and operating galleries in the left background. 3. The filter pipe gallery. 4. The 225-kva substation with Raw Water Station No. 2, in the background at the site of the old plant. 5. The house of the local manager, adjacent to the plant

when operating against a 28-foot head. These are driven by Westinghouse induction motors, and are controlled either from the raw water station or by remote control from the main pump station. Water from this station is delivered into the settling basin through a 16-inch discharge line which is suspended on the walkway piers below walkway level. A steel grating running the entire length of the walkway permits easy access to the discharge line.

Raw Water Station No. 2 was constructed within the old pump-pit, directly over the suction well at the end of the 30-inch intake line. Following removal of all old pumping equipment, this pit was completely filled with brick from the razed pump station building, boiler room and chimney. This station is equipped with one Pomona turbine type pump having a capacity of 2,800 gpm when operating against a head of 30 feet. This pump is driven by a 30-hp Westinghouse motor, also dual-controlled from either the raw water station or the main plant.

Hatchways with removable steel covers are provided in the roofs of both stations over each pump, permitting erection of a temporary hoisting rig for the removal of the pumps when necessary. Both roofs are constructed of Truscon steel joists and steel decking on which was poured a 3-inch reinforced concrete slab.

Chemical House and Settling Basin

The chemical house and settling basin, constructed in 1925, were not affected by the change in lake level and are utilized in connection with the new plant. The chemical house contains Wallace & Tiernan dry feed machines for feeding lime and alum, and also solution feed tanks. Ample storage space is provided for carload purchases of chemicals.

The settling basin, having a capacity of one million gallons, affords a retention period of six hours when operating at a 4-mgd rate. This basin is of reinforced concrete construction, capped with brick. It is constructed as two separate half-million-gallon basins in order that either side may be emptied for cleaning while the other side remains in operation.

Filters and Pump Station

There are four reinforced concrete filters of one-million-gallon daily capacity each. About one-third of the bed is exposed to view from the operating gallery, but the remaining two-thirds of each bed is easily inspected, being well illuminated by lights beneath the concrete slab. Each unit is 15 feet wide by 27 feet long (including wash-water gulley), and has a sand area 15 feet by 24 feet. Laterals of 2½-inch cement-lined cast iron pipe are connected with tees which discharge into a concrete manifold 24 by 36 inches in cross-section. The laterals are on 7-inch centers, and ⅜-inch brass-lined holes are on the same centers in each lateral. The holes are in the bottom of the pipe, and a 1/16-inch vent hole in the top of each lateral at the outer end eliminates trapping of air. Eighteen inches of graded gravel support a bed of 30 inches of sand.

The wash troughs, three in each filter, are of cast iron. These are cast into the wall of the wash-water gulley, at the discharge end, and are suspended at the rear with three sets of steel hanger bolts which permit accurate leveling.

All valves are hydraulically operated from the control tables shown in the operating gallery above the pipe gallery. Each control table is equipped with a rate-of-flow and a loss-of-head gage. The hydraulic valves were furnished by the Iowa Valve Co., and the control tables and gages are by the International Filter Co. At one end of the operating gallery is an Infilco sampling table, where samples may be taken of raw water, mixed water, settled water and filtered water. These samples in glass cylinders readily show the steps of treatment and are illuminated at night.

The arrangement of valves and fittings in the pipe gallery is one which permits easy access to all valves and tell-tale cables, and all valves were installed in a vertical position. The connections from the brass cylinders to the control tables are of ½-inch copper tubing. Each filter is equipped with an International Filter Co. rate-of-flow controller. All interconnecting piping for the sewer, wash-water and effluent lines is below the gallery floor, the influent to each filter coming into the gallery from the rear of the plant and below the filter bottom slab, and making a 180° return bend into the filter within the gallery.

Both the pipe gallery and the operating gallery open into the main pump-room, the operating gallery being 8 feet above the pump-room floor, and the pipe gallery 3 feet below. The operating gallery is reached by stairs at one end of the pump-room, below which are steps to the pipe gallery.

Pump-Room

The pumping station, in which four horizontal centrifugal high-service pumps are located, is directly over the 112,000-gallon clear well serving as a substructure for the building. The pumping equipment installed at the present time consists of the following units:

Two Dayton-Dowd high-service centrifugal pumps, 2,100-gpm capacity, 175-foot head, driven by 125-hp Westinghouse induction motors.

Two Hill high-service centrifugal pumps, 1,750-gpm capacity, 165-foot head, driven by 100-hp General Electric induction motors.

One Dayton-Dowd wash-water centrifugal pump, 5,400-gpm capacity, 42-foot head, driven by a 60-hp Westinghouse induction motor.

Floor space has been provided for the future installation of 2,800-gpm high-service pumps. All pumps in this station are controlled from one central control panel on which are mounted General Electric manual type reduced voltage starting compensators for the high-service pumps, and a magnetic line starter for the wash-water pump. The wash-water pump, however, may be started from either of two push-button stations located on the filter operating gallery.

For neatness in arrangement of the pump-room all discharge piping from high-service pumps is suspended in the clear well below the pump-room floor. All valves and piping in this station were furnished by the Crane Company.

The station output is metered with a Builders Iron Foundry venturi meter. A depth gage on the pump-room floor constantly indicates in thousands of gallons the amount of water in the clear well, and a "peep pipe" located in one corner offers visitors a view of the water in the clear well.

Wing Building

At the right end of the main pump station there is a wing building housing auxiliary equipment, office, chemical laboratory and small shop, all on the same floor level and opening into the pump-room.

In one room of this building are two Wallace & Tiernan Type MSV solution feed vacuum type chlorinators. These are equipped with a two-way distributor, so that chlorine to the effluent may be fed from either machine by simply turning the cock on the distributor. The daily use of chlorine is checked by a platform scale set between the machines, on which the chlorine cylinder is located.

Directly beyond the chlorine room is a chemical feed machine room containing two Wallace & Tiernan dry feed machines, one feeding lime to filter effluent for pH correction, the other held in reserve for this same purpose, or for feeding activated carbon, should this ever become necessary.

The superintendent's office and laboratory occupy two small rooms facing the front of the building, the office being adjacent to the pump-room and the laboratory on the front corner. The laboratory is equipped for all usual plant determinations for CO_2, pH, alkalinity, color and residual chlorine, and complete records are maintained of all such tests and reported monthly to the Alabama State Department of Public Health.

Supplementing an American recording pressure gage on the wall of the superintendent's office is an interesting historical feature—a heavy brass-cased pressure gage reading in pounds and feet. It is one of several installed in the original plant in 1888 and, though it has been in continuous service for fifty years, it was found to be 100 per cent accurate when tested before mounting in the new plant. This gage, furnished with the original Deane steam pumps, was manufactured by the American Steam Gauge Co.

Substation

A modern steel substation structure is located on one end of the main building. This station, of 225-kva capacity, reduces voltage on the incoming lines from 2,200 to 550, which is the voltage of all three-phase major motors in the plant. Auxiliary motors on chemical feeders are 110-volt single phase units.

The plant was designed by the author and was constructed by the company's own forces under the supervision of C. H. Ellis, Construction Superintendent. George H. Godwin, Local Manager, is in charge of the Decatur plant.

The Story of the Uniform Building Code

ON March 7, 1938, 196 cities and counties in 21 states and the territory of Hawaii were reported to be operating under the Uniform Building Code published by the Pacific Coast Building Officials' Conference.

The first public expression of the need for a uniform building code was made in San Francisco in 1922. when, at the request of the late M. C. Woodruff, then Building Inspector of San Jose, 13 fellow building inspectors gathered at the City Hall to discuss mutual problems and to form an organization which had for its purpose the discussion of building regulations and the work of building inspection. By 1925, a number of active building inspectors and others interested in building legislation had become convinced of the need for sound uniform building regulations based on minimum requirements for public health, safety and welfare; and a program for formulating a uniform building code to meet these specifications was originated at the third annual meeting of the Pacific Coast Building Officials' Conference, held in Seattle in September, 1925.

In the same year public district meetings were held in many different cities under the guidance of the Conference, at which building officials, architects, engineers, building materials dealers and manufacturers, contractors and others, prepared suggested sections of a building code. A tentative draft was finally completed and submitted to practically every national technical, research and trade organization and governmental bureau in any way concerned with the subject, for suggestions. The resultant first edition of the Uniform Building Code was published in 1927. The latest edition was published in April, 1937.

The Code is divided into 11 parts: administrative; definitions; requirements based on occupancy; requirements based on location in fire zones; requirements based on types of construction; engineering regulations—quality and design of the materials of construction; detailed regulations; fire-resistive standards for fire protection; regulations for use or occupancy of streets and projections over public property; legislative; and special subjects.

Founded on nationally accepted building practices and incorporating information obtained by research during recent years, the Uniform Building Code presents in understandable form and language the primary regulations necessary for public safety in building construction. The Code is not a specification, but proposes only those provisions which are necessary in dealing with fundamentals of safe construction. Prepared in complete ordinance form with certain blank spaces for the insertion of the name of the city and a few other variables, the Uniform Building Code in most cases may be easily adopted in whole. In cities where no building law existed prior to its adoption, the Code will increase the average level of building costs somewhat, since it proposes certain minimum requirements to insure general safety. However, because of improvements in modern design of buildings and in the manufacture of building materials, its adoption in cities which are already operating under a fairly complete code, may lower, and in fact in a number of cases has lowered, the average building costs without sacrificing the necessary safety. (See also page 137 of this issue.)

2,419 Swimming and Wading Pools Built by WPA-PWA

IN the two years to October 1, 1937, WPA constructed 387 new publicly-owned swimming pools with a total surface area of 6,600,362 square feet, and improved 128 pools, a total area of 2,584,650 square feet.

It also constructed 1,496 new public wading pools of area 959,160 square feet, and improved 45 wading pools aggregating 129,800 square feet.

In addition, under the head of "Recreational Buildings," there were 2,579 projects for the construction of pavilions and bathhouses, improvements to 1,108 of these, and additions to 51.

These figures do not include the work of the Federal Emergency Relief Administration, predecessor of the WPA. It constructed 351 swimming pools and improved 226; constructed 185 wading pools and improved 90; constructed 143 bathing beaches and improved 104; and constructed 135 bathhouses and improved 132.

Portable Paving Plants Used by Oregon

A Novel Method of Paving Adaptable to Municipal Problems

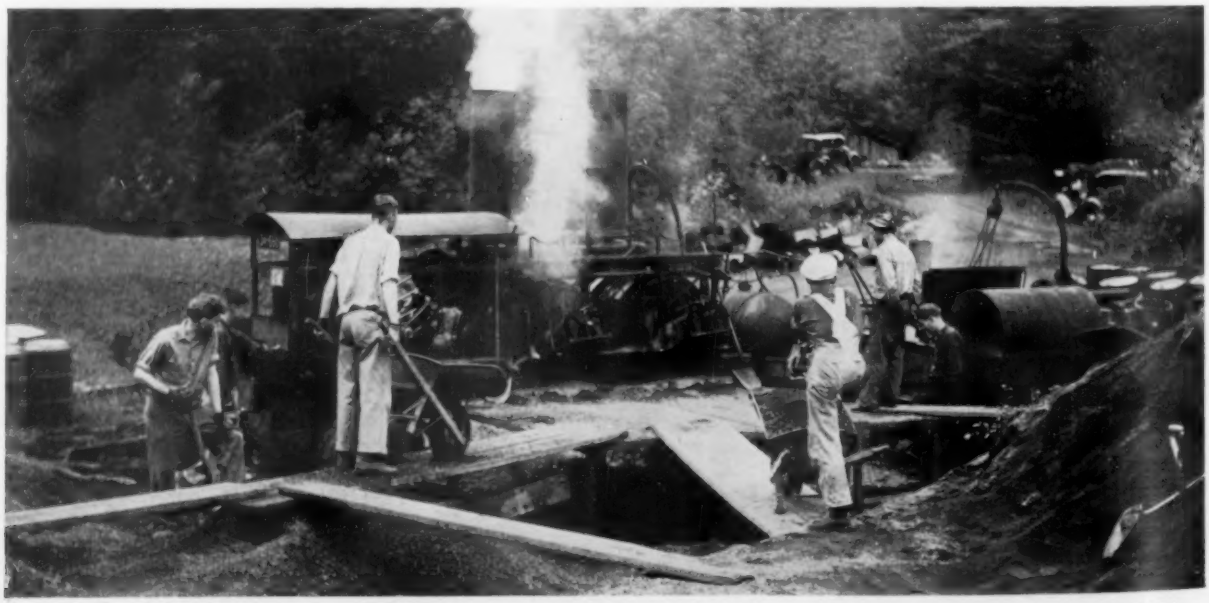
By HENRY W. YOUNG

THE Oregon State Highway Commission is now operating seven portable asphalt paving plants for patching and repair work throughout the state, and for handling small jobs such as bridge approaches and the like. These plants were assembled in the State Highway shops in Salem. They are unlike any standardized equipment on the market, being constructed according to the Department's own designs, developed over a period of about fifteen years.

While the pavement repair problems of a state highway department do not necessarily coincide with those of a municipality, the two have a meeting ground when it comes to costs for doing any particular class of work. Patching is a particular class common to both, and the state has been making such remarkable records in cost reduction, with its portable plants, that many municipalities will be interested in learning how it is done. First among these is the municipality that does not operate a central paving plant of its own but has all work done under contract. Many such have been investigating the possibility of a municipal paving plant, but have found the initial investment to be high and have not yet been able to get into the work in a small way. Small portable plants might make this possible, enabling them to go in for repair work first and so work up.

There are also possibilities in it even when the city owns and operates a central paving plant. Portable plants might be used as auxiliaries on frequent occasions where the patching work to be done does not represent sufficient volume for the most economical operation of the main plant, or where the specifications necessitate alternating the various small mixes. Further, in connection with the fixed plant, the materials, after being drawn across the city to the plants, frequently must be transported back again in the mixed form, perhaps almost to the locality from which they started. It is an advantage of the portable plant that it can frequently be set up at some gravel pit or commercial gravel plant close to the scene of operations, reducing haulage costs to a minimum.

Before going into a description of the portable plant and *how* the state does the work, note first *what* it has done. The following table giving the summary of patching operations tells the story, from 1923, when the state started out with a couple of trailers, one heating and mixing drum, cold stone elevator, and two wood-burning asphalt kettles of 4 barrels capacity each. As will be seen, there has been an almost uninterrupted reduction in costs from year to year. In 1936, the average cost *laid* for all plants was $6.45 per ton, while for the first 10½ months of 1937 it was even lower—$6.05 per ton.



THE PORTABLE PAVING PLANTS ARE CHARGED DIRECT FROM STOCK-PILES WITH WHEELBARROWS AND DISCHARGE DIRECT INTO TRUCKS

PAVEMENT PATCHING IS COMPLETED WITH A 6-TON TANDEM ROLLER

For those interested in a breakdown showing the performance of each individual unit, the second table gives an analysis of plant costs and performances up to the week ended October 15, 1937. These figures, being cumulative, give the performances for the year, up to that date.

Type of Plants Used by State

Weighing 11,760 pounds each, complete, these plants are readily transported, completely portable units, less than two hours being required to set up and get into operation. Each unit is carried on a four-wheel trailer having a wheelbase of 160 inches and using 32 x 6 tires. The frame of the trailer is so constructed as to take all cross members to carry all trunnion bearings.

Two mixing drums are mounted crosswise of the trailer, each being approximately 48 inches I.D., and each having a capacity of 800 pounds to the batch. Heat is supplied to the drums by two No. 8 oil burners mounted on movable racks. Suitable baffles are provided in each drum for mixing the batch, and also a movable discharge chute for emptying the drum. The drums are mounted on trunnions driven by roller chains, the tracks on the drums resting in the trunnions. A speed of 18 rpm is proper for mixing the batch.

The power plant consists of a four-cylinder gasoline engine with a capacity of approximately 25 developed horsepower. On it is a 4 to 1 speed reducer with clutch. This drives a countershaft, which in turn supplies power for the blower and air compressor. The blower is used to obtain additional draft for carrying off exhaust fumes and gases from the drums, the compressor supplying air pressure on the 100-gallon fuel tank.

The stacks are 18 inches in diameter by 10 feet high and are mounted on hinges so that they can be folded back. Charging the drums is done direct from the stock-pile with wheelbarrows. The mixed material is discharged direct to trucks, which back up to the discharge chute.

Building the mixing plants represents primarily an assembly problem in the Highway Department shops at Salem. The trailers are bought complete from a local trailer manufacturer, being built to specification. The other elements of each unit are standard equipment—Buffalo blower, U. S. air compressor, Continental gasoline engine, Hauck oil burners, etc. The complete plant is, however, different from any standard, complete unit available on the market. As far as the Department is concerned, it does not care to be in the manufacturing business, and would not be in this case if all the features of design in this plant, worked out over years of trial and experiment, were available in any standard unit at an equivalent price. But, as a general rule, advancement in the art of road building and maintenance is ahead of the manufacturing field. And so the Department, when it needs a certain kind of equipment to do certain work and finds nothing available, simply goes ahead and designs and builds it. Municipalities, on the other hand, may find entirely satisfactory portable plants of smaller capacity available from recognized manufacturers.

Similarly, the Department is not in the paving business, and would not be doing this patching and repair work if it could be done as well and at the same time as cheaply any other way. As an example, many a state highway passes through a municipality but is maintained by the

SUMMARY OF OPERATION OF PAVEMENT PATCHING PLANTS

Year	Tons	Cost per Ton
1923	2,163	$15.72
1924	6,389	13.29
1925	17,959	11.89
1926	15,720	13.08
1927	9,416	12.86
1928	14,574	10.62
1929	31,034	9.35
1930	41,000	8.82
1931	35,218	7.43
1932	17,312	6.81
1933	23,063	6.85
1934	32,416	7.19
1935	39,709	6.96
1936	56,127	6.45
1937	66,028	6.05

ANALYSIS OF PAVING PLANT COSTS AND PERFORMANCE

OREGON STATE HIGHWAY COMMISSION
Maintenance Department

For Week Ending October 15, 1937

Crew No.	Foreman	Total Elapsed Days	Total Days Worked	% of Days Worked	Total Tons Laid to Date	Tons per Elapsed Day	Tons per Day Worked	Total Cost	Cost per Ton	Cost per Elapsed Day	Cost per Day Worked
1	J. P. Hodges	151	110	72.85	9,997.00	66.21	90.88	$59,058.10	$5.91	$391.11	$536.89
2	E. L. McElvain	172	130	75.58	10,798.60	62.78	83.07	66,346.91	6.14	385.74	510.36
3	Ivan Dakin	160	107	66.88	8,926.00	55.79	83.42	54,540.20	6.11	340.88	509.72
4	Louis Kerber	169	113	66.86	7,252.41	42.91	64.18	41,565.74	5.73	245.95	367.84
5	F. A. Starkey	184	138	75.00	8,342.09	45.34	60.45	53,367.93	6.40	290.04	386.72
6	V. L. Moffitt	137	97	70.80	9,925.25	72.45	102.32	57,499.96	5.79	419.71	592.78
7	Leo Kerber	167	123	73.65	10,787.00	64.59	87.70	67,007.05	6.21	401.24	544.77
	Total	1,140	818	71.75	66,028.35	57.72	80.72	$399,385.89	$6.05	$350.34	$488.25
	October 16th—36 Total for corresponding date last year	1,235	880	71.26	56,126.68	45.45	63.78	$332,265.25	$6.45	$293.33	$411.67

state. If the municipality itself, or any contractor, could do the work of repair and maintenance at the same or less cost, the state would be glad to be relieved of the job. But thus far neither the cities nor the contractors seem to be able to meet the state on cost, and, at that $6.05 per ton laid, there is little wonder that they can't.

Other equipment accessory to the portable paving plant proper and used on a patching job consists of:

6 light trucks
2 pick-up trucks
1 6-ton roller
1 trailer for roller
1 service trailer (used as an office for the timekeeper and for gas service)
1 large truck for transporting the 6-ton roller
3 asphalt kettles with kerosene burners (one 300-gal., one 100-gal. and one 50-gal.)
1 flush-coat cart

A crew of approximately 30 men is required for each outfit, including foremen, bosses and flagmen.

The seven dual drum plants were built by the state during 1930 or later. It may be of some interest to note that, for the plants built during that year, the average cost was $3,344.74 per plant. The average life of a plant is set at 5 years of 149 days worked per year. In other words, the average days worked per life is 745. The average depreciation per day is $4.48, and the average overhaul is $3.00 per day, making the total cost of plant per day $7.48.

The above general description of the plant, together with the figures on operating costs, etc., were obtained through the courtesy of R. H. Baldock, State Highway Engineer, Oregon State Highway Commission. While the description covers only the main features of the equipment, and is not in sufficient detail to permit of actually building a plant therefrom, Mr. Baldock's Department has generously offered to supply any municipality interested with the necessary construction details.

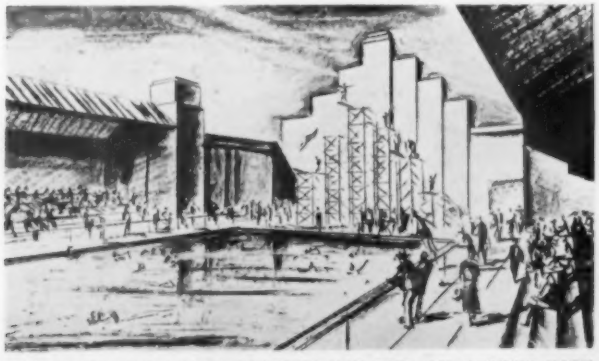
San Francisco Fair Plans Novel Swimming Pool

THE world's most novel swimming pool is planned for the 1939 Golden Gate International Exposition on San Francisco Bay. According to plans which have been designed, this unusual plunge will be of glass and stainless steel, allowing spectators to view the swimmers from the bottom and sides of the pool.

Visitors entering the building through the imposing entrance gates of the structure will pass into the foyer, which will be under the shallow half of the pool. Six-foot square panels of glass one inch thick will form the bottom of the pool to permit visitors in the foyer to watch the movements of the swimmers. Tilted mirrored walls will give full vision of the tank above. Passing upstairs to the mezzanine, spectators will be enabled to follow the progress of swimming events by walking along the observation galleries. Glass panels along the sides will be 5 feet high and 60 feet long.

The proposed plunge building will be 156 feet long and 115 feet wide, plans calling for a pool 55 by 110 feet. Twelve lanes will be provided by the pool for swimming events. The deep portion of the pool, from 14 feet up, will be of stainless steel and the remaining portion of glass. Chromium steel trim will be used around the top. On the sides of the pool will be runways 20 feet wide of brightly colored composition material.

One of the most amazing features will be the stands and diving boards, which will be constructed of plastic glass. These glass diving boards are said to meet all requirements for intercollegiate diving events. Five towers and seven diving boards are planned. All panoramic backdrops in back of the diving platforms will be of glass, behind which will be colored neon tubing for dramatic lighting effects.



NOVEL SWIMMING POOL PLANNED FOR THE 1939 GOLDEN GATE INTERNATIONAL EXPOSITION ON SAN FRANCISCO BAY

On either side of the pool will be bleachers for approximately 2,000 spectators. Dressing rooms will be located underneath the spectator stands. The top of the plunge will be open, but a movable glass top roof will permit the building to be completely enclosed in case of inclement weather. Lighting of the pool and the entire plunge room, including the spectators' gallery, will be accomplished by under-water lighting.

It is believed that the design of this pool is of unusual significance in the matter of teaching the youth of America correct methods of swimming. Millions of visitors will for the first time be able to get from all angles candid views of expert swimmers in action. In all likelihood the better swimming schools and plunges throughout the country will in time adopt this type of visual tank.

In connection with various educational and recreational departments, it is expected that a number of important swimming and diving competitions for youths of all ages will be presented in the pool during the 288 days of the Exposition.

The water for the pool will be entirely fresh, supplied from the Exposition's 3,000,000-gallon reservoir. The cost of the entire structure is estimated at $200,000. Mark Daniels of San Francisco is the architect.

Citizens Sponsor Regional Plan

UNDER the guidance of Mary Jane Green, a group of local civic-minded people of Tucson, Arizona, is organizing a non-profit corporation entitled "Tucson Regional Plan, Inc.," and building up an endowment fund. The corporation intends to function much as the New York Regional Plan. It will employ technicians to make the necessary studies in the region and to formulate a master plan and such detailed plans as are called for by the growth and development of the district. The group is at the same time sponsoring legislation to give the county authority to carry out plans and enforce zoning regulations. The movement has the endorsement of the city and county officials and of the City Planning Commission, which has never been furnished with the funds to provide more than an advisory service to the city, as well as the support of the large property owners and influential citizens of the district. It is expected that the first engineers will be employed in the autumn, and their first job will be to study the water supply and the rural zoning problem.

A "Motor-Safe" Residential District

Cerritos Park, California

LONG BEACH, CALIF. (estimated population 185,000), has the distinction of being first among major cities of the West to present a large-scale scheme for development of an attractive residential neighborhood in which the old-time methods of subdividing are superseded by a practical, up-to-date community design. The plan, here reproduced, was designed by Charles H. Cheney, city planner, of Palos Verdes Estates, Calif.

In the Cerritos Park plan the dangers of fast traffic, and street noise and dust, are largely done away with. Walks and motorways are entirely separated, sidewalks being taken off streets. Pedestrians use walks through parks, in the center of large 40- to 80-acre superblocks. Motor access to each home is provided by tree-lined lanes, indented into the superblocks. Each lane ends in a T-shaped cul-de-sac, or turn-around, forming a dead-end street. With our new fast motors, the dead-end street is by far the safest to live on. Reduction in number of through streets is the latest objective in good planning.

As a result of this ingenious arrangement, each architecturally attractive home will face upon a beautifully landscaped community park or walk, instead of a public thoroughfare. These walks and parks will be continuously linked by broad ramps underpassing the traffic highways separating the superblocks. Residents will thus have many miles of shaded and safe pedestrian ways, playfields, bridle-paths and wooded lanes. In providing these modern advantages, the designer has sought to use the best of the experience gained in similar residential layouts such as Radburn, N. J., Greenacres, Long Island, etc. The plan has the cordial support of both city and county planning commissions.

Architectural Control

Equally important with the land planning is the careful and complete system of protective restrictions adopted for the area. To ensure good architecture, neighborhood harmony, and increasing beauty for the community, a permanent architectural board has been established which will pass on the design, color, and location of all buildings, walls, signs, etc., and issue permits for them before construction is started. A perpetual non-profit maintenance corporation is also established, called Cerritos Park Association. Every lot owner automatically becomes a member of it, and is subject to an annual upkeep tax. The Association will own the parks and playgrounds, and enforce the restrictions, which include a complete zoning ordinance, a housing code and other specifications necessary to a high-class neighborhood. They are subject to amendment, but under reasonably difficult circumstances, thus relieving the over-rigidity of old-type deed restrictions. They follow the protective schemes successfully tried at Palos Verdes Estates, Rancho Santa Fe, and St. Francis

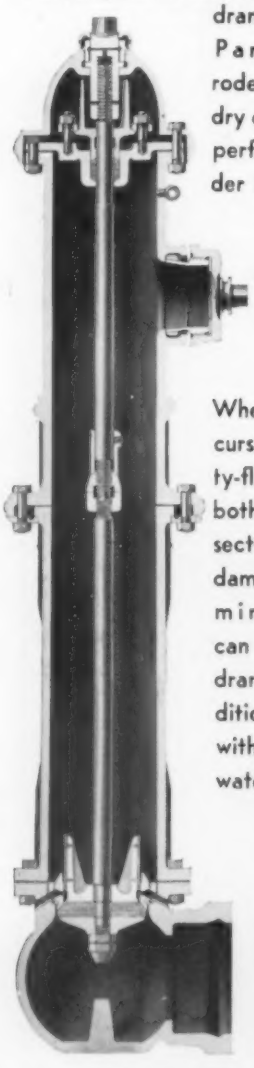
NEW MOTOR-SAFE PLAN FOR A 1,000-ACRE RESIDENTIAL DISTRICT

Superblocks are of 40 to 80 acres, with freeway (no frontage) boundary traffic streets. All lots back up to short dead-end service lanes and face walks through parks in centers of blocks. These parks are to be continuous, connected by underpasses from superblock to superblock. Half-mile circles shown

MUELLER COLUMBIAN

FIRE HYDRANT

The entire top working mechanism of the MUELLER-COLUMBIAN is sealed away from the water zone and automatically lubricated every time the hydrant is operated. Parts cannot corrode. Packing cannot dry out Continuous, perfect working order is a certainty.

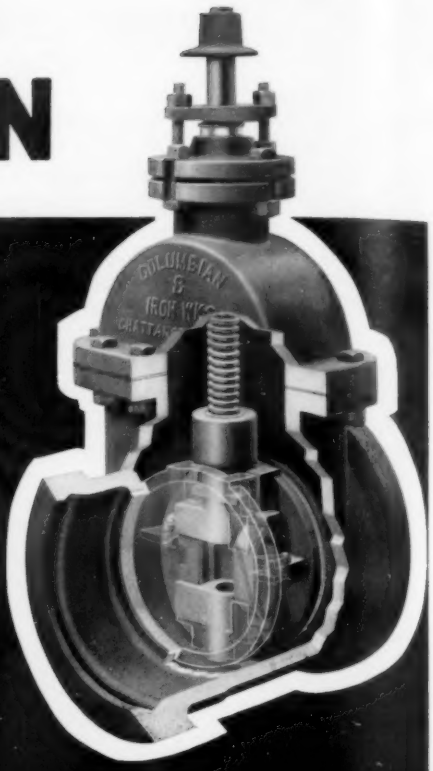


THE SAFETY FLANGE

When collision occurs, only the safety-flange breaks and both top and bottom sections remain undamaged. Within 30 minutes one man can restore the hydrant to original condition for about $5, without digging or water cut-off.

SECTIONAL VIEW . . . . ILLUSTRATES THE MANY ADVANCED FEATURES

Be sure you have complete information about the MUELLER-COLUMBIAN Improved Fire Hydrant and Gate Valve. Detailed explanations and illustrations are ready for you. Write, today.



4 POINT CONTACT GATE VALVE

All MUELLER-COLUMBIAN Gate Valves, regardless of size, have the exclusive Four-Point Contact Wedging Mechanism. They may be operated in any position by manual, hydraulic or electric power.

AN UNDUPLICATED COMBINATION OF FEATURES

1. No Binding of Stem
2. Non-Rusting Packing Bolts and Nuts
3. Easy to Repack
4. No Scraping of Discs on Seats
5. Pressure Equally Distributed on Discs and Seat Rings
6. No Leakage
7. No Sprung Discs
8. No Incrustations
9. Gate Assembly Can't Fall Apart
10. No Side Strains on Stem

THE WEDGING MECHANISM WORKS LIKE THIS

When the valve is being closed, the discs move to position opposite the ports. The bottom wedge then comes in contact with a rib in the bottom of the valve, preventing further downward movement. Further movement of the stem causes top and bottom wedges to force side spreaders against corresponding wedges on the discs. The side spreaders act as equalizers between the top and bottom wedges, transferring force from the wedges equally to four points around the edge of each disc. In opening, the stem lifts the top wedge nut away from the side spreaders, removing pressure between discs before they begin to rise, preventing scraping and any possibility of breaking seat rings or scoring the valve stem.

MUELLER CO.
CHATTANOOGA, TENNESSEE

Wood on the west coast; the Country Club District, Kansas City; Forest Hills Gardens, Long Island; and Roland Park-Homeland-Guilford in Baltimore.

Cerritos Park is being developed in widely separated unit tracts which, however, since the completion of the general plan in the spring of 1937, have conformed thereto. Jotham Bixby Company, owners of the area under development, previously had recorded maps of Bixby Knolls, shown on the lower left-hand corner of the plan; and Bixby Terrace, on the lower right-hand corner, on the old through-street type of layout. Atlantic Village, at the north end, is a low-cost housing project, in which the first unit of 22 houses is completed on the new plan.

Community Association

Over a million-and-a-half dollars had been invested in homes in these tracts, some of the houses being among the finest in Long Beach. Owners of homes in the old subdivisions are being given opportunity to join Cerritos Park Association and gain the advantages it offers. It was felt that one comprehensive neighborhood plan, administered by one strong community association, rather than by separate and smaller associations for each of these tracts, was the soundest community policy, both for home buyers and for the sellers.

The economy of this type of planning is well known. Mr. Cheney's studies showed that in the 60-acre Bixby Terrace tract (old-type subdivision shown in lower left corner of plan) 29.8 per cent of the area was lost in streets and alleys. The new-type plan has the same or more frontage, but only 20 per cent of the area in streets. Ten per cent of the area can economically be put into parks. The short lanes need only narrow pavements. In fact, there is approximately enough saving on improvements, over the old system, to furnish and plant the parks.

Thus a safer and much more attractive way of living may be provided for this increasingly dangerous motor age, at approximately the same cost as the old horse-and-buggy subdivision. It can be obtained, however, only by careful planning and consistent follow-through of each unit, as opened.

A Successful Swimming Pool for a Town of 10,000

By DON B. RUSSELL
City Engineer, Oskaloosa, Iowa

THE 1937 swimming season grossed $2,600 at the Oskaloosa, Iowa, municipal pool, built in 1936 with $20,000 city money and a $25,000 WPA grant. Tuesday and Thursday mornings were free to children 14 years or under, with regular admission of 25 cents for adults and 10 cents for children; season tickets were respectively $3.50 and $2 extra. Towels 5 cents. No bathing suits were rented, and no concessions were operated by the pool management.

The Bathhouse

Native stone was used to build the 52 x 100-foot bathhouse. The only finishing applied to the inner side of the stone walls was a waterproofing made of a mixture of lye, alum and pure cement in water. All the inner partitions are made of 8 x 12-inch clay building block and finished with aluminum paint. All counters, windows, bag racks and wooden fixtures are finished with aluminum paint. The floors are of concrete with numerous drains.

The wings of the bathhouse contain the dressing room and are slightly longer than the central portion (which houses the lobby, check-room and filter plant) making the plan resemble a block "I." About 1,400 square feet were allowed for each wing. In the women's side there are 24 booths built near the center of the floor space in adjoining pairs with an individual shower between them. Ample passageway has been allowed about these separate dressing compartments. Four toilets, two lavatories, a large, double make-up table equipped with mirrors and bench, a

FUN AT OSKALOOSA, IOWA, PAID $2,600 IN 66 DAYS

wringer and sink and twelve showers have proved fully sufficient. In the men's side the twelve booths are placed near one end of the room. Eight showers (in a common shower room), three toilets, three urinals, two lavatories, wringer and sink, and two long dressing benches take care of the maximum patronage. Footbaths are located in the doorways of the rooms.

The "locker" system is the Bemis Bag system which allows the clothes to hang in light and air from racks made of ordinary ¾-inch pipe and in wetproof canvas bags. The bags are ingeniously fitted about a wooden clothes hanger; the rung makes a neat hang for men's pants or women's dresses, and the outside offers a form for the coats. Shoe pockets are arranged on the front outside, and the large pocket which forms the bag holds miscellaneous articles. These bags hang in a central check-room accessible from the dressing rooms by service windows. This requires for

BIG 6

South Bend Street Flushers

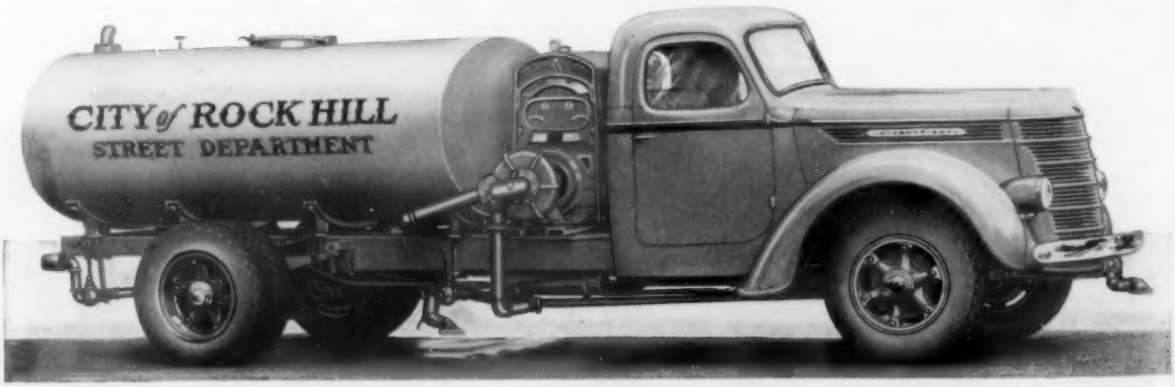
FOR the *smaller* towns and villages, the SOUTH BEND *Suburban Model* Street Flusher is recommended as most economical and satisfactory.

For the *larger* cities, the SOUTH BEND "*BIG* 6" will be found to be eminently successful in cleaning *all types* of streets both effectively and economically. The "BIG 6" covers a wider range of capacities—800 to 3,000 gallons—and will clean any width up to 42 feet. One nozzle cleans a strip 16 feet wide; two nozzles, 28 feet; three nozzles, in one operation, a strip 42 feet wide.

Any SOUTH BEND Street Flusher, of capacity large or small, can be depended upon to do a thorough job of removing from the pavement all types of street dirt, litter, leaves, etc. Wet leaves, washed into the gutter, do not blow back. Snow and slush are washed away, too, when air temperatures are above freezing. Cars parked along the curb do not impede the progress of SOUTH BEND Flushers. The nozzles throw the spray *under* the parked cars, cleaning the pavement thoroughly.

Write for the illustrated circular on the "*BIG* 6" or on the "*Suburban*" —or *both*.

MUNICIPAL SUPPLY COMPANY
SOUTH BEND INDIANA



the total checking-room space, racks and all, only 650 square feet.

The pool itself is 75 x 150 feet and 2 1/3 to 9½ feet deep, the water level being maintained 3 inches below the scum-gutter lip. The system, comprising pool, recirculation lines, filters, mixing basin and wash-water lines, requires 450,000 gallons of water, with about 10,000 gallons replacement per day.

Recirculation and Purification

State Department of Health regulations require a weekly report covering recirculation, chlorine used, lime and alum and copper-sulphate used, filter-run in hours, the cleaning and filling of footbaths, lavatories, showers, algae in pool, cleaning of runways and bathhouse, and the average of residual chlorine (tested four times daily). These regulations require a bath before entrance to the pool, and a footbath on each journey to and from the pool. Skin diseases, sore eyes, open cuts and blisters are excluded.

The recirculation and purification system consists of a rapid sand filtration plant, recirculation pump, wash-water pump, inlet and outlet lines, 28 scum-gutter drains, 4 main-outlet drains in the bottom of the deep end, and 10 inlets, 3 on the deep end and 7 about the shallow end. The pool is filled from a 4-inch city water-supply main into the mixing basin, where it is stirred with the chemicals. Then the water passes by gravity through the 27 inches of sand (in the filters) down through 18 inches of assorted layers of gravel into the cast-iron laterals and manifold, being drawn from here by the pump into the recirculation line, where it is forced into the pool through ten inlets. Chlorine is fed directly into the recirculation line. The scum-gutter drains and the pool-bottom drains are connected to a manhole. The water is returned to the mixing basin by gravity for recirculation or directed by valves to a storm sewer. Water from the pool enters the mixing basin by gravity and re-encounters the chemicals from the dry-feed machines, and these are whipped into it by a mechanical agitator, and re-circulated through the filters and into the pool. To wash the filters, the recirculation line valves are closed, and the wash-water pump brings water from the pool into the manifold of the filters, out through the gravel and sand, to force the overflowing scum of previously filtered sediment into cast-iron troughs, where it drains into a chamber (a part of the filter) on the low end of these troughs and on out through a storm sewer to the creek.

Constructing the Pool

The 10-inch pool wall and scum gutter were poured as one unit up to within 5 inches of the sidewalk grade. The wall reinforcing ran into the sidewalk, and the walk reinforcing was tied onto the wall reinforcing. All ladders were set in the sidewalk and anchored at the bottom into the pool wall. The lifeguard chair, two one-meter boards and the three-meter board were all set in sockets placed in the concrete sidewalk. (The ideal solution is to block out the walk for these units and pour them after the sockets and equipment are set up in place). Two cork life-lines were fastened in the wall above the scum gutter by means of brass sleeves and screw-eyes.

Four steel poles 26 feet long placed on the sides and just back of the sidewalk support a double reflector apiece, which contains two 1,000-watt lamps; this gives the entire system 8,000 watts—very satisfactory light for the pool itself. The cost of light and power for the pool and bathhouse averages $3.50 per day.

Stone-faced bleachers border the pool on the north. An attractive concession building using native stone wherever tasteful will evolve also on the north side of the pool. Additional landscaping will create a parking area accommodating more than 200 cars.

Blight Caused by Premature Subdivision of Outlying Areas

CONDITIONS common to many metropolitan regions which are unwholesome in the extreme are presented and discussed in the report on "Premature Subdivision and Its Consequences," by Philip H. Cornick, listed on page 137 of this issue of THE AMERICAN CITY. "Large areas of land, suitable as yet only for extensive uses of a rural type, have been subdivided far in advance of need into hundreds of thousands of parcels, fitted in shape and size only for intensive urban uses. One inevitable by-product of the premature subdivision for urban purposes was the creation of hundreds of miles of unneeded and unused streets, equipped out of the proceeds of bond sales with all of the public improvements essential to the health, welfare and safety of an urban population which has not yet arrived. . . .

"But the effects of the blight are not confined to the prematurely subdivided areas themselves. The increased costs of government which grow out of the expenditures for local improvements in the subdivisions fall in higher taxes also on the unsubdivided areas in the vicinity of the vacant lots. The increased burdens on holdings of this kind are sufficient to wipe out in some cases the entire net incomes which the owners can derive from using those lands for the only purposes to which their properties are suited. As a consequence, those holdings also fall victims to the blight, and tend to appear in increasing numbers on the annual lists of properties in arrears.

"By a process of shifting inherent in the municipal bond laws, and in the general and special tax laws of the state, the burden of the levies which the directly blighted areas cannot carry falls on the properties elsewhere. In addition to meeting the costs of constructing and maintaining the public improvements, and of providing the public services, which they need and use, these properties must assume in addition the costs of improvements and services which nobody needs and which nobody wants to use."

The existence of this situation has of course been a matter of more or less common knowledge among municipal and county officials and property owners generally; but no such comprehensive study of the extent of the problem, with constructive remedies for its cure and prevention, has heretofore been available.

As the author says in his concluding paragraph: "The land of our fathers is also the land of our children. Upon us, as temporary trustees, devolves the duty of managing wisely and conserving well this basic heritage of the race."

To those who are awake—or are willing to be awakened—to the seriousness of this problem of the premature subdivision of real estate, whether in New York State or elsewhere, a careful study of Mr. Cornick's report, and action, are commended.

POUNDING ALONG

BUT TRINIDAD CAN TAKE IT!

East Fayette Street, Baltimore, Md., topped with 7000 square yards of Trinidad Sheet Asphalt.

Heavy motor-freight traffic is a sign of good business. It also shows the need for top-quality pavements. And Barber invites highway engineers and others interested in low-cost-per-square-yard-per-year paving, to study the many advantages of Trinidad Lake Asphalt.

Trinidad Lake Asphalt is a native asphalt "mined" from the famous asphalt lake on the southern Caribbean Island of Trinidad. It has already withstood centuries of exposure to a year-round summer sun, the fury of countless tropical tempests. Today—because of its ductility—it has the resiliency to withstand the shocks of heavy traffic, even at low temperatures. It contains a colloidally dispersed wear-resistant mineral filler which has not yet been duplicated in any commercial asphalt. It is uniform in quality.

Trinidad Native Lake Asphalt pavements are ideal for today's exacting traffic conditions. Clip and mail the coupon below, pinned to your letterhead, for full and complete information.

TRINIDAD NATIVE LAKE ASPHALT

THE BARBER COMPANY, Inc., Dept. AC-4, 1600 Arch Street, Philadelphia, Pa.
Please send me complete information about the Barber Products checked below.

- ☐ TRINIDAD LAKE ASPHALT — For hot mix, for cold-lay sheet asphalt and asphaltic concrete pavements.
- ☐ BARBER EMULSIFIED ASPHALTS — Used cold for penetration, pre-mix, road mix (mixed in place) and surface treatment work.
- ☐ GENASCO CRACK FILLER — For maintenance of concrete roads.
- ☐ BARBER BRAND LIQUID ASPHALTS — For cold surface treatment — for hot surface treatment.
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- ☐ GENASCO BLOCK AND JOINT FILLER — For brick and granite block streets.

When you write for that catalog, kindly mention THE AMERICAN CITY.

Housing Projects Approved for Five Cities

ON March 17, 1938, 4½ months after the United States Housing Authority was set up under the administration of Nathan Straus, the President approved the first five contracts for slum clearance and low-rent housing projects in the cities of Austin, Texas; Charleston, S. C.; New Orleans, La.; Syracuse, N. Y.; and Youngstown, Ohio. In his letter to Nathan Straus President Roosevelt said: "It is a special source of satisfaction to me that the cities submitted to me on the United States Housing Authority List No. 1, constitute almost a cross-section of the varied life and history of our country. . . . It is good to know that the benefits of the United States Housing Act are being distributed over so wide an area among cities differing in everything else, but alike in being afflicted with blighted areas and slums."

The reports submitted by the five cities to substantiate their claims for the first Federal loans show a degree of slum-consciousness that is most extraordinary, considering its recent development. When we hear a proud city like New Orleans pointing with shame to its own "Bed Bug Row" and Youngstown to its "Monkey's Nest," we can feel sure that progress has its foot in the doorway. Furthermore, these cities are showing a convincing will to self-improvement by their readiness to participate financially. Under the United States Housing Act, at least 10 per cent of the original capital development cost of every housing project must be borne by the localities. Every locality has met that standard, frequently in part by outright donations, but more generally through agreement to sell local housing authority bonds to local investors. In no case will these local loans bear more than 3½ per cent interest, proof positive that private local capital can be induced to enter the field of low-rent housing at lower interest rates than have ever before been provided for housing. In addition to loans, the cities must contribute annually in the form of subsidy at least 20 per cent of the Federal annual contributions provided to achieve low rentals. Here the first five cities have outdone themselves, assuming an obligation averaging 56 per cent of the Federal annual contributions, generally in the form of tax exemption.

Variations in Size, Type and Cost

The data on the five proposed projects show variation in size, type and cost. More than 81 per cent of the new dwellings will be built on the sites of slums actually cleared.

In Austin, Texas, a city of 60,000 population, slums will be torn down which are patched with tin, lumber and canvass, floored with dirt, and serviced with water from hydrants on the streets. The new housing will be located on three separate sites and will aggregate 186 dwelling units in the form of one-and two-story group houses and two-story flats. The average net construction cost per dwelling unit is estimated at $2,549, and the total cost of the projects, including land, demolition, utilities, etc., at $714,472. The average rent anticipated is about $2.75 to $3.00 per room per month, including water but exclusive of any other utilities.

In Charleston, S. C., 65,000 population, the site surrounding Cromwell's Alley, notorious as one of the worst slums in the city, will be cleared, thus removing living conditions that have contributed to the fact that the general death rate per thousand in Charleston has been almost twice the average for the whole United States. The new housing in Charleston will be divided between two sites, and the number of dwelling units will total 216, most of which will be four- or five-room in one- and two-story row houses. The average net construction cost per dwelling unit will be $3,463, and the total estimated cost of the projects is $1,129,900. The rents, including water but no other utilities, are anticipated at a $4 per room per month average.

In Syracuse, N. Y., population 220,000, the slums to be cleared are badly blighted areas within walking distance of the business district, fallen into such a bad state of repair that they constitute a jungle of shanties with the most primitive conditions. A single project is contemplated in this city, containing 678 dwelling units in three-story apartments, two-story flats and group houses. Here the average net construction cost per dwelling unit will be $3,800, and the total estimated cost of the project, $4,366,700. Average rents anticipated are $4.25 per room per month, including water.

In New Orleans, La., population 500,000, the slums to be cleared include two densely built-up sites described by the Housing Authority of New Orleans as among the worst slum districts in the city—areas where almost all the houses are without ordinary water and sanitary facilities and where the death rate is over 30 per cent higher than for the city as a whole. Here will be provided 1,397 new dwelling units on two separate sites in the form of one- and two-story row houses and flats. The expected average net construction cost per dwelling unit is $3,997, and the total estimated cost of the projects, $9,345,700. The rents will average about $3.90 per room per month, including water.

In Youngstown, Ohio, population 180,000, a badly blighted site will be cleared in one of the worst areas of the city, bordering upon the "Monkey's Nest," so called because of its tumbled-down pine shacks. In this area, according to a recent survey, over 75 per cent of the housing was deemed unfit for human habitation, and over 90 per cent had no private sanitation. The new housing project will provide 600 dwelling units at an average construction cost of $3,864 per unit, and a total estimated project cost of $3,150,000. Rents will average about $4.25 per room per month, including water.

Elements in Total Costs

A comparison of construction costs per dwelling unit in these five new projects shows a range of from less than $2,500 to about $4,000. These are, on the average, 10 to 20 per cent below the statutory limit set by Congress. These figures hold with the payment of prevailing wages and a construction designed to last for 60 years. The costs of demolition, grading, site improvements, the construction of utilities and play spaces and other recreational facilities average about $800 per family dwelling unit in the five projects. The third element in the cost is land. The 19 per cent of the total new dwellings to be on vacant land involve a land cost per dwelling unit which reaches a low of $250 and averages $411. The 81 per cent of the new dwellings to be located upon centrally located slum sites involve an average land cost per family dwelling unit of $1,682, which includes the cost of the old slum dwellings which are to be destroyed.

Public Housing Now Tax-Exempt in 28 States

NATHAN STRAUS, Administrator of the United States Housing Authority, hailed the action of the Alabama State Supreme Court in ruling that low-rent housing projects are exempt from state and local taxation. Alabama is the twenty-eighth state to grant this exemption.

Mr. Straus pointed out that $4,500,000 has been earmarked for low-rent housing projects in Birmingham, and $1,400,000 has been set aside for projects in Mobile. Both earmarkings were made subject to a condition that the local authorities supply an amount annually equal to at least one-fifth of the annual subsidy of the United States Housing Authority to assure low rentals. The only generally feasible means of meeting this requirement seems to be through partial or complete tax exemption.

The Alabama Court held that land used for public housing projects comes within the purview of that section of the state constitution which restrains the Legislature from taxing real estate or personal property of corporate bodies of the state, county, or municipality, and that a local Housing Authority has the status of a municipal corporation within the meaning of this provision of the constitution.

Its functions are public in nature because the local Housing Authority is charged with the duty of enforcing an important element of the police power in its supervision of proper housing conditions.

For DIGGING · LOADING BACKFILLING, etc.

WM, with bulldozer blade placing bucket on Hough loader, backfilling on a sewer job, Staten Island.

Topsoil for 120 trucks of 3½ yards capacity—that's what this Model WM tractor and Hough loader digs and loads in an 8-hour day on Staten Island. Topsoil is being used for landscaping around Seaview Hospital and City Poor Farm.

Model WM and Hough loader on transport wheels and in place for towing across town

ALLIS - CHALMERS WM TRACTO AND HOUGH LOADER

Here's a fast-moving, powerful outfit that will save the c time and the taxpayers' money by enabling you to han a great many small jobs in a hurry. With this outfit you c backfill, excavate, load trucks in pits or from stock pi sidecast or load surplus dirt, slope banks, clean ditches gutters, load snow, etc. Change from bucket to backfill blade or snow plow is quickly made. Tractor is alw available for drawbar work. Can be easily and quic towed from one job to the next on its transport wheels. No jacks required either mounting or dismounting of wheels. Ask y nearest Allis-Chalmers dealer to show you h this handy, quick-moving outfit can help y city.

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Gentlemen: Please send catalog on Hough loader and Model WM tractor ( ). Ask your dealer to call ( ).

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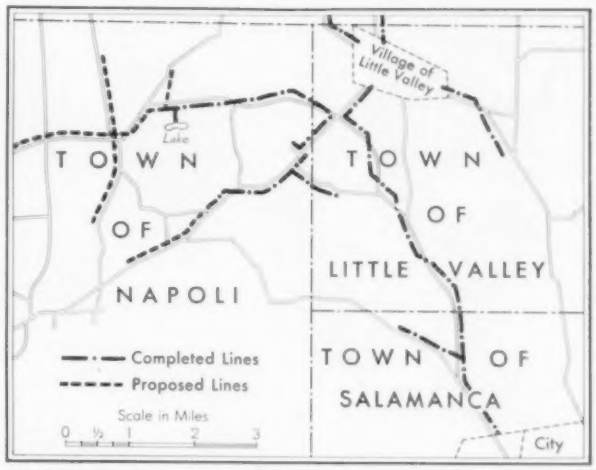
ALLIS-CHALMER
TRACTOR DIVISION—MILWAUKEE, U.S.A.

The Business System of a Small Municipal Electric Utility

By LYLE UNDERWOOD
Superintendent, Electric Light Department, Little Valley, N. Y.

THE Little Valley municipal electric utility dates back to the days when large company transmission and distribution systems had not spread over the state, and the small local electric business was not attractive to a private concern. To get service at all in these early days, the village had to run its own plant. The Village Board of Trustees and the Mayor directly managed the utility as a very active board of directors, governing the Superintendent.

Until the recent changes about to be described, the Department was somewhat casually referred to as the "electric light plant," although our little old steam station had been dismantled for several years, and purchased energy was being distributed. The Superintendent had quarters in the old plant building, which had become storehouse, office, and substation. This building was not a convenient place to pay bills or make service requests.



COVERAGE OF LITTLE VALLEY, N. Y., ELECTRIC DISTRIBUTION SYSTEM

Old Methods Inadequate

Bills were made out by the Village Clerk and mailed. They were paid at his office, which was not a full-fledged municipal office but an informal adjunct to the insurance business conducted by the Clerk. There was no continuously operative accounting, other than the cash accounts of the Village Clerk and the Village Treasurer and the consumers' bill records. A highly detailed annual report had been required for years by the Public Service Commission; and as the end of the fiscal year came around, the Department's collection of cash accounts, consumers' records, vouchers, invoices, payrolls, contracts, receipts, and deposits, which had been kept basket-like, were thrown at an accountant to make up the best sort of report he could, and reconcile it with the Clerk's and Treasurer's accounts.

Through our Municipal Electric Utilities Association, we came to see that we could not meet the requirements embodied in the Public Service Commission's new uniform system of accounts without a thoroughgoing revision of our paper-work. We even went so far as to open a small office on a main street, where now our billing and accounting is done, where bills are paid, and where customers can meet the Superintendent and the Board. I was a little skeptical at first about installing a complete accounting system, for I thought the expense would be burdensome; but now I am convinced that the extra work involved is not excessive and is well worth while for the results secured. We know where we stand at any time in regard to our investment in property, our various other asset accounts, our operating expenses to date and their trend, our changes in revenues, our receivables unpaid, our energy distributed for various classes of service, our materials and supplies available and needed, and so on. The Mayor and Trustees would not go back to the old simplicity, if they could.

It has been necessary to give the Superintendent an office assistant. This cannot be entirely charged to the new office plans, for the distribution system has grown steadily and the work for one or two more linemen or electricians has to be planned and supervised.

In our present system, the Superintendent's office handles all accounts and statistical records. This includes keeping the general ledger, making consumers' bills, revenue accounting, issuing purchase orders, checking invoices for payment, and preparing vouchers and payrolls for approval of the Village Board and payment by the Village Clerk. The latter makes all disbursements and has custody of all funds and bank accounts except temporary cash collections awaiting deposit. The Village Board audits all invoices for material purchases and other disbursements as they are presented by the Superintendent, and authorizes all payments.

Perpetual Inventory

We are using a hand-posted continuing-property record which consists of a detailed ledger of operating property accounts and is a perpetual inventory of plant and property employing original costs. It shows all the plant and property used by the utility, with costs set up by classes such as land, structures, poles, conductors, transformers, and meters, subdivided by tax districts. The accounts of this property ledger are controlled by the general ledger account. We started this continuing-property-record system by an inventory and appraisal (on original cost basis).

Split-case model

In

NEW ORLEANS

. . . on display

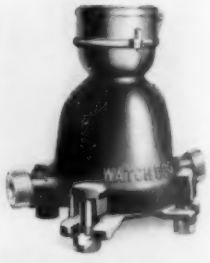
and IN SERVICE

WORTHINGTON-GAMON
WATER METERS

Built for the Future
. . . on a foundation of EXPERIENCE

BACKED by a manufacturer pledged to satisfactory performance of its products . . . with more than 75 years of uninterrupted meter building experience . . . Worthington-Gamon Meters represent the utmost in durability and accuracy, to meet present and future requirements. Millions of these meters are in service throughout the United States today . . . demonstrating their superior features.

Be sure to see the Worthington-Gamon
Meters on display at the Convention



Frost-proof model

WGS-6

WORTHINGTON-GAMON METER COMPANY
General Offices: HARRISON, NEW JERSEY

District Sales Offices and Representatives:

ATLANTA BOSTON BUFFALO CHICAGO CINCINNATI CLEVELAND DALLAS DENVER DETROIT EL PASO HOUSTON KANSAS CITY
LOS ANGELES NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS ST. PAUL SAN FRANCISCO SEATTLE TULSA WASHINGTON

Branch Offices and Representatives in Principal Cities of Foreign Countries

WORTHINGTON-GAMON

During April we hope you will remember to mention THE AMERICAN CITY.

This system and the work-order system for property changes were required by the Public Service Commission for larger utilities than ours, but neither we nor the engineers and accountants of the Municipal Electric Utilities Association could see how we could adequately meet other accounting requirements of the Commission without these features.

Work-Order System

A work-order system which controls and records use of materials and labor we believe is the most practical method of recording property items created by construction. All additions and retirements in the operating property are controlled and reported through the work-order routine, as are the costs. When a job governed by a given work order is complete and all the charges and credits thereto have come through the accounting routines, the costs of the job are collected and the units of created property are developed and checked. The work order, which has been accounted for as "Construction in Progress," is then closed and transferred to the continuing-property record.

The complete detailed information which supports the changes in the continuing-property record originates in the field from time reports, material issue tickets and retirement reports, routed through the proper work order. All entries to the various operating expense accounts originate from the same source but are routed directly and not through the work-order system. All our accounting is hand-posted—we are not large enough for any machine accounting.

The Superintendent or his clerk, as acting storekeeper, writes debit tickets covering all materials issued from stores, whether for new construction or for maintenance. A debit ticket for construction issue covers materials for only one work order; materials issued for maintenance are shown on separate tickets. Space is provided on this debit ticket to record the various accounting steps as they are made. The moneys relating to the various issued materials are entered on the debit tickets from the prevailing average unit prices on the Materials and Supplies record, which is a perpetual inventory visible-index card system. The storekeeper also enters on the debit tickets a percentage of material costs for stores expense, this percentage being determined by experience. If some of the issued material remains unused, the job foreman turns it in to the storekeeper, who writes out credit tickets. Salvaged materials delivered to stores are also recorded on credit tickets, but no percentage loading for stores expense is applied to salvage credit tickets.

The foregoing debit and credit tickets are numbered consecutively for ready identification. They are both made out with carbon duplicate, and both copies are delivered to the Superintendent's clerk after posting to the Materials and Supplies record. The original debit and credit tickets which relate to construction work orders are placed in the proper work-order files. The original tickets which relate to operating-expense accounts are placed in their proper files. At the end of each month, the clerk summarizes the tickets of each work order and also those of the operating-expense accounts. These summaries are used as a basis of a journal entry for transfer to the control account in the general ledger. All these summaries with their tickets permanently attached are then returned to their files.

The duplicate debit and credit tickets are filed in the office of the Superintendent in numerical order and permanently retained for cross-reference. Lost and spoiled tickets are accounted for in the numerical (duplicate) file, so that this file may be complete and useful for checking the completeness and accuracy of the work-order and other tickets.

Time report tickets are made out in duplicate by the job foreman—one ticket for each day and each work order or operating account. The job foreman reports hours only. The money amounts are computed and entered by the Superintendent's clerk, who also enters on the time reports the truck charges applicable to that work. The duplicates are collected in a file for the current pay period and used at the end of this period for payroll make-up. After being certified by the Superintendent, the payroll goes to the Village Clerk, who draws the pay checks. The payroll is then returned to the Superintendent's office for accounting record. After the payroll distribution has been completed, the duplicate time reports are filed in numerical order for easy reference.

A perpetual inventory of all material going through the stores department is maintained and at the end of each month is in balance with the control account of the general ledger. This record is kept on cards which are posted daily by the storekeeper from invoices and debit and credit tickets. From time to time the storekeeper checks his stock of various items with the balance shown on his card. When he finds a discrepancy, he reports it on a debit ticket and adjusts his card. The Superintendent's clerk will at his next posting date carry this discrepancy as a debit or a credit to stores expense or the appropriate operating-expense account. The prices used on this inventory represent the weighted average price of all these units then in stock and not necessarily the latest invoice price. This scheme eliminates the grand annual inventory.

We also keep a statistical record of the distribution system in a visible index card file. This consists of a card for each pole in the system. These cards show the size, height and kind of poles; the date set, location and ownership, together with every item the pole carries, including conductors. Similar cards record the history of meters and transformers. This record is not tied to our accounting system but is used only as an operating aid.

Depreciation Figured Monthly

In connection with our valuation, we made a careful study of age, condition and life-expectancy of the several kinds of plant and property, set up an initial depreciation reserve balance by transfer from surplus, and found what the annual depreciation expense should be. We develop this depreciation expense monthly, but keep watch of our experience to see if the rates should be changed.

Ready for Any Rate Case

It has been found easy to analyze each month's kilowatt-hours billings by rate steps, and on short notice we can find the cost of service to various classes, the exact effect of rate changes, the property allocated to various services, and the rates of return. This has been invaluable in meeting the scrutiny of our business by the Public Service Commission and in adjusting our rates with reasonable fairness to different customers. We no longer fear the delays, irritations and expense of a rate case, for with minimum outside advice and assistance we could meet, and have met, any rate situation inside a week or two.

GOOD NEWS SPREADS FAST

Protect your pool patrons with PERMUTIT water . . . Conditioned automatically!

IT PAYS TO PLAY SAFE

How would you like to have PURE, *safe* water—water that is actually purer than drinking water standards? How would you like to keep it that way all day—*seven days a week?* Permutit makes that easy. Permutit equipment removes dirt, color and germs from water. *And it works automatically.* It purifies and re-purifies every drop of water in your pool three or more times a day! This saves time of draining and cleaning pool. It saves pumping in fresh water. It allows seven-day-a-week operation (won't the public cheer!)

HURRY—SUMMER IS COMING!

Forget your worries about swimming-pool water. You can assure your taxpayers of pure, SAFE water and cut pool expenses at the same time when you install Permutit Equipment. Write today for 40-page manual . . . swimming-pool layouts . . . specifications. No obligation. Address The Permutit Company, Dept. G-3, 330 West 42nd St., N. Y.

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Automatic Filters • Hair Catchers
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Special Pool Fittings
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Automatic Chemical Feeders

Permutit
The Water Conditioning Headquarters
for 25 years

When you write for that catalog, kindly mention THE AMERICAN CITY.

Residential Street Improvement

Low-Cost Methods Required Commensurate with Traffic

By JOHN H. AMES
City Manager, Ames, Iowa

EVERY city, large as well as small, has a substantial mileage of streets that carry but a moderate amount of residential traffic, yet are sufficiently important to warrant some measure of improvement. If merely a graveled surface is provided on these streets, there is the necessity of continual maintenance, replacement of materials, and extensive dust treatment. On the other hand, streets of this classification do not require expensive, high-type surfacing, and property owners rightfully object to high paving assessments. The obvious answer lies in a good, low-cost street improvement method, capable of extending the same benefits to daily traffic volumes of several hundred vehicles that a paved surface extends to traffic volumes of several thousand.

While street officials have long recognized the need for a low-cost but adequate type of surfacing, the practical fulfillment of this need has become possible only within the last few years. It has come about through the development and application of soil principles to the stabilization of road and street surfaces.

The city of Ames was among the first municipalities to make use of soil-stabilized street construction, and our present enthusiasm is based on our very favorable experience with this improvement method.

Curb and Gutter Work

Our first program started in the summer of 1934 with the construction of concrete curbs and gutters on approximately three miles of streets, in several residential districts. The entire cost of this curb and gutter work was levied by special assessment against the benefited property. The city, in turn, agreed to bear the expense of providing and maintaining a satisfactory street surface between the gutter slabs, from general city funds.

ROOSEVELT AVENUE, AMES, IOWA, PAVED WITH A BITUMINOUS MAT ON A STABILIZED BASE

TWELFTH STREET, AMES, IOWA, WITH A SURFACE STABLILIZED WITH CALCIUM CHLORIDE

The integral curb and gutter, of conventional design, was constructed with a thickened front edge of 8 inches, to give greater supporting strength to the gutter slab and to avoid any possibility of the slab's being undermined during the 6-inch base course excavation. This work was performed under contract and was completed in 1934. We feel that the use of a curb and gutter section is very desirable, since it provides an adequate means for surface drainage, furnishes a rigid edge for the base and surface construction, and enhances the finished appearance of the street.

Preparation of Grade

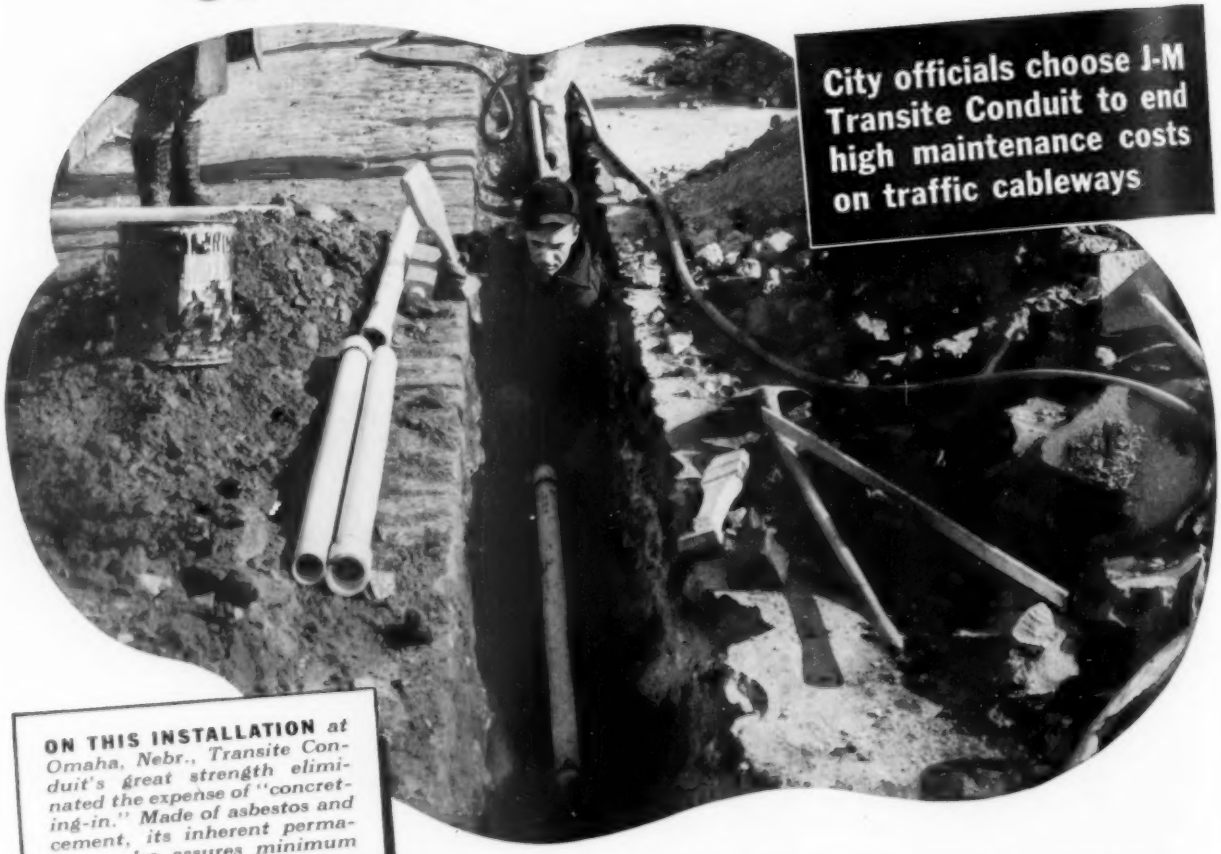
Early in the spring of 1935, the streets were excavated, under contract, to a depth of 6 inches below finished grade, and the subgrade brought to a true section by means of a blade grader and small tractor, augmented by sufficient hand work to insure accuracy in the final section. A crown of 6 inches in a 30-foot street width, the same as specified for the finished surface, was maintained in the subgrade.

After the subgrade had been thoroughly compacted by rolling, it was covered to a uniform depth of 3 inches with pit-run gravel, hauled to the streets from a local gravel pit. This run-of-pit material met the following gradation specifications:

Passing 1½-inch square opening	100 per cent
Passing ⅜-inch sieve	50-75 per cent
Passing No. 8 sieve	25-50 per cent
Mudballs, clay, silt and unsound particles not exceeding	8 per cent

A light blade grader and some hand labor was used to spread this base material and, after being brought to grade and section, it was rolled with a 5-ton roller. The pit-run gravel contained about 5 per cent of clay, and there was sufficient moisture present to attain some degree of compaction.

MODERN CONDUIT CUTS COST OF OMAHA'S SIGNAL SYSTEM



City officials choose J-M Transite Conduit to end high maintenance costs on traffic cableways

ON THIS INSTALLATION *at Omaha, Nebr., Transite Conduit's great strength eliminated the expense of "concreting-in." Made of asbestos and cement, its inherent permanence also assures minimum maintenance throughtheyears.*

AFTER careful comparison with other ducts, J-M Transite Conduit was selected for replacements in the traffic-signal system of Omaha, Nebraska. Mr. C. R. Weir, Secretary to the Commissioner of Police and Public Safety, says:

"Transite Conduit has enabled us to renew the underground system of our Traffic Signals in such a way that the installation will last for many, many years to come, and eliminate the inconvenience and expense we have experienced during the past two years."

There's a sound basis of fact for this statement. J-M Transite Conduit is made of two *permanent* materials—asbestos and cement. It cannot burn, rot or decay. Non-metallic, it is unusually resistant to corrosion. On signal systems throughout the country, its use is bringing substantial savings through reduced upkeep costs.

But permanence and virtual freedom from maintenance are only part of the story. Economies start with installation. For Transite Conduit's great strength permits installation without a concrete envelope, effecting large savings in labor, materials and time.

J-M Transite Conduit minimizes maintenance not only on signal systems, but on electrical transmission and distribution systems of every type. Check its many advantages yourself. Full details are given in our engineering brochure on Transite Conduit. For your free copy, write Johns-Manville, 22 East 40th St., New York, N. Y.

JM JOHNS-MANVILLE *Transite Electrical Conduit*

Placing Stabilized Mixture

A stabilized mixture of gravel, clay and calcium chloride was then placed in two layers, each of approximately 1½-inch thickness. This stabilized material was hauled from a central mixing plant to the streets and was spread in the same manner as the base course. Each of the 1½-inch layers was carefully bladed to maintain proper grade and section and thoroughly rolled, with the result that the final stabilized surface seldom showed a variation from grade or section greater than ½-inch in 10 feet. The streets were opened to traffic as soon as the final rolling was completed.

The gravel for the stabilized surface was obtained from a pit located about six miles from the central mixing plant. As it came from the pit, the material was passed through a portable screening and crushing plant, and the oversize stone reduced to ¾-inch size or below. A careful check was made to see that the material conformed to the following gradation specifications:

Passing 1-inch sieve	100 per cent
Passing ⅜-inch sieve	50-75 per cent
Passing No. 8 sieve	45-55 per cent
Mudballs, clay, silt and unsound particles not exceeding	8 per cent

Clay used in the stabilized mixture was prepared and pulverized in a small brick and tile plant, and had a plasticity index of 35-36. This plant-prepared clay was very finely pulverized, in ideal condition for mixing with the gravel, and its high plasticity index made it necessary to add only 11 per cent of clay to the gravel.

The central mixing plant consisted merely of a 15-cubic-foot concrete mixer mounted on an elevated platform. Correct proportions of gravel and clay were delivered to the mixer in wheelbarrows, and the necessary calcium chloride was added prior to the mixing operation. The materials for each batch of mixture consisted of 16 cubic feet of gravel, 2 cubic feet of clay, and 10 pounds of calcium chloride. The time required for mixing each batch of material was from one-half to three-quarters of a minute. It was unnecessary to add water during the mixing, since the gravel contained sufficient moisture for this purpose, and the calcium chloride served to retain the necessary moisture bond during the compaction period. The stabilized mixture was deposited directly from the mixer into dump-body trucks and hauled to the streets.

Following the construction of the stabilized surface, the streets were opened to traffic for a period of about two months. During this time the streets were rolled after each rain and, during very hot weather, after the surface had been watered by means of a street sprinkler-truck. Under this process, any loose or floating stone that appeared on the surface was worked in, and the treatment produced a very firm and hard surface.

Bituminous Surfacing

Late in the summer of 1935, a light bituminous mat was placed on the stabilized course. This bituminous surfacing consisted of three applications of asphaltic oil and two applications of crushed stone, giving a resulting thickness of approximately ¾-inch. The street surface was first primed with a light asphaltic oil, MC-1, applied by means of a pressure distributor at the rate of 0.3-gallon per square yard. The street surface was so dense that this material was absorbed very slowly and it was necessary to allow several days to elapse before the light oil had penetrated sufficiently to permit the binder coat to be applied. The prime coat was next covered with an application of asphaltic binder, RC3, at the rate of 0.25-gallon per square yard and was immediately followed by covering the surface with ½-inch of crushed stone chips applied uniformly to the surface at the rate of 25 pounds per square yard. The stone chips were applied with mechanical spreaders and the surface broom-dragged immediately thereafter. The final application of stone and binder was at the same rates just mentioned, resulting in a final binder coat consisting of a total of 50 pounds of stone and ½-gallon of binder per square yard of surface. The completed surface was then thoroughly broom-dragged, rolled and opened to traffic.

City forces were used in the construction of the gravel base and the stabilized course. The bituminous surface was constructed by contract. While the project was not primarily intended as a relief measure, hand labor was used as much as possible, and the work gave employment to about forty men.

The streets came through the winter of 1935 in such excellent condition that, in the summer of 1936, the City Council proposed similar improvements on a number of other residential streets. This new work called for assessing the entire cost of the benefited property, with the exception of the grading expense. This proposal was welcomed by the property owners and there were very few objections to the proposed assessment.

During the late summer and fall of 1936 and the spring of 1937, we constructed 3 miles of calcium chloride-stabilized streets, following essentially the same construction procedure as in the 1935 program, but with all work performed under contract. The specifications varied in some minor details from those used the previous year.

The contractor accomplished the mixing of the stabilized materials in a more efficient manner, by setting up a mixing plant at the gravel pit to eliminate double handling. The gravel was taken from the pit by means of a dragline and, after screening and crushing of the oversize, was carried by a belt conveyor to the large paving mixer which served as the mixing plant. Plant-prepared clay, of the same characteristics as used in the 1935 work, was stock-piled near the mixer, together with the supply of calcium chloride. Carefully measured amounts of each material were fed into the mixer in the same proportions as was the case in 1935, and the resulting stabilized mixture was trucked directly to the streets.

All the streets on this second construction program are being carried as open stabilized surfaces, without bituminous covering. They have set up very firm and hard, and two surface applications of calcium chloride this season, ½-pound per square yard early in July and ¾-pound per square yard on the 1st of September, have kept them absolutely dustless.

The streets constructed on both the 1935 and 1936-37 programs are located in some of the city's best residential sections, including the College Heights and College Park districts. Our success with this low-cost street improvement method has demonstrated its successful use for residential streets, and public demand will undoubtedly result in other stabilization programs of similar character.

"Sure 2" pipe should be *permanent* —use CAST IRON"

Back of the nationwide swing to McWane 2" *cast iron* pipe are the same sound reasons that made you standardize on cast iron for all 4" and larger mains. No leaks—no losses — no replacements. So why not spend a few *pennies* more per foot for

McWANE 2" CAST IRON PIPE

and make your entire distribution system *rust-resisting* and *everlasting?* The few extra pennies involved in first cost mean 80, 90, 100 more years of service. When *permanence*—and *dollars*—are at stake, be *penny* wise! Write for folder WG-36!

Visit Our Displays, New Orleans A.W.W.A., April 25th!

Sand Cast Inside and Outside

McWANE CAST IRON PIPE COMPANY

BIRMINGHAM, ALA. SIZES 1¼" THROUGH 12"

Chicago, Dallas, Denver, Kansas City, New York, Portland, Ore., Salt Lake City, San Francisco, Los Angeles.

McWane PRECALKED JOINTS

Joints are factory made and inspected—uniform—pipe and joint are one.

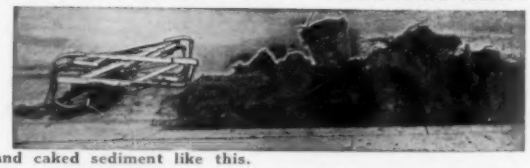
No lead melting or pouring on the job. Just socket and calk!

McWane Precalked cast iron pipe can be laid as fast as the best machine can dig the trench.

MALE AND FEMALE THREADED JOINTS

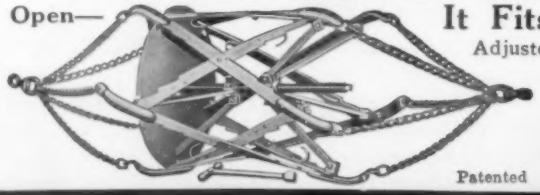
This *oversize*, extra strong joint is always the intermediate joint in 18-ft. laying lengths of McWane 2" cast iron pipe. It does not reduce the internal diameter — the only joint as strong as the pipe itself. Only McWane can give you the long 18-ft. lengths with only *one* intermediate joint!

EXPANDING ROOT CUTTER & SEWER CLEANER



Open and in action removing roots and caked sediment like this.

Open—



Patented

It Fits in on Every Sewer Cleaning Job

Adjusted in 30 seconds to fit any sewer from 8 to 30 inches.

Will clean the entire sewer wall, top, and sides as well as the bottom, cutting and removing the roots and caked sediment, putting the sewer system in almost 100% clean condition.

Write for our new catalog on complete sewer cleaning equipment.

EXPANDING SEWER MACHINE COMPANY

108 East Walnut St. Nappanee, Ind.

Orderly Water Billing in Minneapolis

By J. A. JENSEN
Engineer of Water Works, Minneapolis, Minn.

WATER-METER reading and billing are continuous (daily) operations at Minneapolis, so that the load of work is evened and no congestion occurs at the counter or cashiers' cages in the matters of complaints and payments.

The city is divided into three water districts averaging 31,300 accounts per district, and readings are taken and bills rendered quarterly on these 94,000 accounts. The meters are in the basement, where fewer readings are possible than would be the case if they were in boxes at the walk. About 100 meter reading sheets, placed in a leather-bound ring binder, constitute a day's readings for one reader. Readings in each district rotate in such order that they fall on practically the same monthly date in each quarter.

We have recently installed a modern accounting and billing system consisting of three forms: (1) the meter reading sheet; (2) ledger sheet; (3) bill form. An addressing machine prints on all three forms the owner's name, address, any special mailing instructions as shown in the illustration, and certain code information. In the figure 2B01 in the first line, the 2 means second district, the B represents the street name and is the initial of the street index, and the 01 shows the order of the B's, the cipher being used to permit two digits where necessary so that the code is always a four-digit index. After the dash is the house number. This is a simple and convenient method for sorting and lining-up the coupons in posting the cash and stamping in the credits.

This first line of code information is spaced two lines above the name, so that the "window" envelope will cover the code, leaving only the three lines visible for mailing. The 2-1 at the end of the third line is a control division for office use in balancing the cash work in groups.

Meter Reading Sheet

The large figure 2 on the meter reading sheet indicates the second district. The square diagram represents the house, the X showing ingress by a rear door, and the small circle the location of the meter.

The readers are rotated in the routing, and the diagram is a quick clue to entrance and location of the meter. The sheet embraces four years of quarterly readings with the previous reading brought forward. The notations show in the sample that the owner was not at home when three of the readings were attempted. The S indicated that the May reading was entered on a "pick-up sheet" or special. The August consumption was below normal at 19 hundred cubic feet. The reader then opened a laundry faucet and found indications that the meter registered apparently O.K. and was not stopped. In November no one was at home, and the reading was estimated. In February, the owner returned a "card" left there for the purpose, as indicated by the C notation. Further failure to read the meter would involve communication with the owner and an appointment for an actual reading. The reading "up" on the sheet was made merely for the reader's convenience in the subtractions. The change in index in August from 989-hundred to 8-hundred indicates that the meter had just "run by" the capacity of the dials and was repeating. All dials are of the round reading type, not for convenience, but the earlier meters were of that type and these have been continued for uniformity.

Individual Ledger Sheet

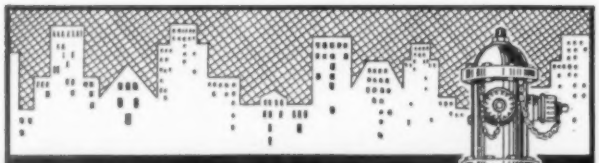
The corresponding ledger likewise runs for four years by using both sides. One side is printed in black ink, and the reverse in red for identification in case of accidental reversal in the tray. The ledger form is preferred to the stub, because it carries the history of the account for ready reference. This sample shows that the customer paid the gross amount in May, as evidenced by the dated receipt stamp. The November consumption was estimated as marked. The meter reading index also indicates a "run by" reading. All the entries are printed-in by the billing machine. In other cases the matter of payments, turn-off records and penalties would show on the card, all of which forms a convenient reference if a customer appears for complaint or a re-check following an unusual or disputed consumption. The form is triple-notched for setting over in the cash balancing work, and makes it possible to check delinquents, unpaid accounts, etc. When the four-year form is filled, the cards are placed in a transfer file for future reference when required. This need happens most frequently when the new card is first started, because the history is on the old card just filed.

The Bill

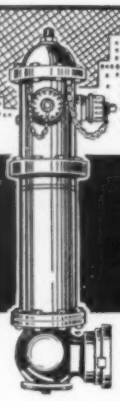
The bill is self-explanatory. Fifteen days are allowed for "net" payment. The dates are made prominent. The approximate period is shown at the top. The reading dates are rather difficult because of the practice of continuous reading, and billing every day.

The printing of the bills and imprinting the addresses is done from a continuous roll of paper by an Elliott addressing machine. The stencils are of a special filled silk composition in a paper card frame. They are indexed on the top part of the frame, and the stencils are cut by any standard typewriter employing a simple holder. These stencils are light, durable and very convenient. The machines will address and print 50 bills per minute. About 1,500 to 1,800 bills are sent out each day.

Ledger card and bill form are inserted together in Burroughs billing machines, and after setting up the keys the billing amounts are printed-in automatically, and the carriage returns to the first position. The ledger is thus always a true copy of the bill, and its completion is proof that a bill was made out and sent to the customer. A clerk lays out the reading books and ledger cards in convenient



FIFTY YEAR RECORD of PERFORMANCE



The final test of any product is performance in actual operation. Kupferle fire hydrants, under all conditions, have been making good for more than a half century.

The Kupferle fire hydrant line is complete—two distinct types and all sizes—there is a Kupferle hydrant to meet your requirements.

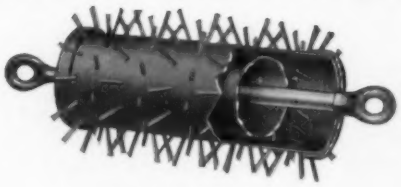
Kupferle fire hydrant specification sheets sent on request.

—•—

JOHN C. KUPFERLE FOUNDRY CO.
ST. LOUIS, MO.

KUPFERLE FIRE HYDRANTS

TURCO SEWER BRUSHES



Send for Catalog 7-A

TURBINE SEWER MACH. CO., Inc.
5210 W. State St. Milwaukee, Wis.

Johnson City Fire Hydrant

Not just another hydrant—but one designed to overcome difficulties heretofore troublesome to water works men and fire chiefs . . . with an *extra factor of safety* for severe service.

Not easily damaged; but *if* ever injured, easily and quickly repaired without shutting off the line and without digging.

Write for circular giving complete details.

Johnson City Foundry & Machine Co.
Johnson City, Tenn.

IN WATER PLANTS

Raw Water Aeration
Quick Chemical Mixing
Coagulant Mixing
Contact Mixing
Recarbonation
Filtered Water Aeration

IN SEWAGE PLANTS

Activated Sludge Aeration
Trickling Filter Auxiliary
Mixing For Chemical Precipitation

"Jung Suction"
AERO-MIX
AERATOR - MIXER

A type and capacity to fit every existing or contemplated plant.

Gravity—Rotary
Pneumatic—Pressure.

Write for illustrated folder.

Vogt Mfg. Co. Inc. P. O. BOX 1122 LOUISVILLE - - KY.

HOTEL CHELSEA

FROM $6 WITH MEALS & BATH
$3 ROOM ONLY & BATH
Per Person 2 in a Room Less Weekly

RIGHT ON THE BOARDWALK

Here you will find everything to further your comfort and enjoyment — cutside ocean-view rooms . . sun deck . . . beautiful dining room at the ocean's edge . . . superb cuisine . . . varied sports . . . and entertainment. You'll like your fellow guests . . . and the delightfully friendly atmosphere of The Chelsea.

SPECIAL WEEKLY RATES
WRITE FOR BOOKLET AND INFORMATION

ATLANTIC CITY

JOEL HILLMAN - J. CHRISTIAN MYERS - JULIAN A. HILLMAN

RAIN - - at the turn of a valve

Skinner System of Irrigation provides either portable, semi-portable snap valve, hoseless or complete underground equipment to keep your parks, parkways and beauty spots always fresh and beautiful. Skinner offers a complete engineering and consulting service that has met every type of watering problem. We can handle your watering problems better and at lower cost. A card or letter brings our New Catalog and details of our service. No obligation.

SKINNER SYSTEM Pioneer in Leader for over a quarter Century

THE SKINNER IRRIGATION CO.
447 Canal St., Troy, O.

HOTEL LENOX

Home of Hospitality

Lenox guests come back again and again because they enjoy Lenox hospitality, homelike rooms, good food and convenient location, not to mention the—

Moderate Rates

Single .....$2.50 to $3.50
Double .....$3.50 to $6.00
Family Suites $7.00 up
Special for 2 Rooms and Bath: 3 persons $6.00; 4 persons $7.00
Write for free AAA road map and booklet containing handy map of downtown Buffalo.
CLARENCE A. MINER, Pres.
140 North St., Buffalo, N. Y.

BUFFALO, N. Y.

groups for the billers, and after use returns these records to the files. A carbon journal sheet is made by the machine for checking each control.

On the cash-receiving end, the work is assembled in the same control order, and summaries are made daily for posting.

METER READING SHEET
CITY OF MINNEAPOLIS—WATERWORKS DEPT.

2B01-2310 5/8 NSH 1068091 **2**

EMILY LAUDERDALE
2310 BLOOMINGTON AVE
MAIL TO 326 PLYMOUTH BLDG 2-1

FRONT

DATE	READING	CONSUMPTION	REMARKS
NOV.			
AUG.			
MAY			
1940 FEB.			
NOV.			
AUG.			
MAY			
1939 FEB.			
NOV.			
AUG.			
MAY			
1938 FEB.	C. 64	29	Away
NOV.	35	E 27	Away
AUG.	8	19	Test pk
MAY	S. 989	30	Away
1937 FEB.	959	31	
FORWARD	928	40	

2

2B01-2310 5/8 NSH 1068091

EMILY LAUDERDALE
2310 BLOOMINGTON AVE
MAIL TO 326 PLYMOUTH BLDG 2-1
CHANGE OF NAME

DESCRIPTION	AMOUNTS GROSS	AMOUNTS NET	REMARKS OR ADJUSTMENTS	DATE DUE	METER READING
	267	233		1 FEB. 1937	959
DATE PAID		FEB 10 1937			
	259	225		3 MAY 1937	989
DATE PAID	MAY 24 1937				
	164	143		2 AUG. 1937	1008
DATE PAID		AUG 10 1937			
EST	233	203		1 NOV. 1937	
DATE PAID		NOV 8 1937			
	250	218		1 FEB. 1938	64
DATE PAID					
				MAY 1938	
DATE PAID					
				AUG. 1938	
DATE PAID					
				NOV. 1938	
DATE PAID					

CONSUMERS LEDGER

CITY OF MINNEAPOLIS—WATER WORKS DEPARTMENT

OFFICE HOURS: 8 A.M. to 4 P.M. Saturdays Closed

WATER BILL NOV.-JAN.
CITY OF MINNEAPOLIS-WATER WORKS DEPARTMENT

DATE DUE FEB. 1 1938 **FINAL DISCOUNT DATE FEB. 16 1938**

METER READINGS PRESENT	METER READINGS PREVIOUS	SIZE OF METER	CONSUMPTION	DESCRIPTION	GROSS BILL	NET BILL
64	35		29		250	218

Meter Size	Minimum Quarterly Bill
⅝ inch	$1.60
¾ inch	2.50
1 inch	2.50
1½ inch	5.00
2 inch	8.00
3 inch	14.00
4 inch	25.00
6 inch	50.00
8 inch	80.00

WATER RATE
Per 100 cu. ft.

2B01-2310 5/8 NSH 1068091

EMILY LAUDERDALE
2310 BLOOMINGTON AVE
MAIL TO 326 PLYMOUTH BLDG 2-1

GROSS BILL TO BE CHARGED IF NOT PAID ON OR BEFORE FINAL DISCOUNT DATE. FAILURE TO RECEIVE BILL DOES NOT ENTITLE CONSUMER TO DISCOUNT. WATER MAY BE TURNED OFF WITHOUT NOTICE AFTER FINAL DISCOUNT DATE.

METER READINGS AND CONSUMPTION SHOWN IN EVEN HUNDREDS CUBIC FEET

PAY AT CITY TREASURER'S OFFICE, ROOM 121 - BRING THIS BILL WITH YOU

CITY OF MINNEAPOLIS - WATER BILL COUPON

DATE DUE FEB. 1 1938 DISCOUNT DATE **FEB. 16 1938**

DESCRIPTION	GROSS BILL	NET BILL
	250	218

2B01-2310 5/8 NSH 1068091

EMILY LAUDERDALE
2310 BLOOMINGTON AVE
MAIL TO 326 PLYMOUTH BLDG 2-1

RETURN THIS COUPON WHEN REMITTING BY CHECK TO H. C. BROWN, CITY TREAS.

FACTORS IN WATER ACCOUNTING AND BILLING AT MINNEAPOLIS

Glimpse of the addressing machine, and the three modern forms for meter reading, individual ledger and the bill

Is Excessive Pumping Cost PULLING DOWN THE PROFIT in YOUR WATER DEPARTMENT?

Is the possibility of a worthwhile profit from your water department being held down by costly maintenance and high operating expense of old and uneconomical deepwell pumps? Is the cost of pumping from crooked or poorly constructed wells (inherited from former years) so great that new wells seem to be the only solution?

The answer to both questions is the BYRON JACKSON

SUBMERSIBLE DEEPWELL TURBINE PUMP

Here is the fundamental difference between the SUBMERSIBLE and other deepwell pumps: The motor and pump are direct-connected, assembled as a unit, and operate completely submerged in the well. The only surface equipment required is a weather-proof, tamper-proof switchbox. There is no long shaft to waste power through friction in many bearings, or to cause trouble if the well is crooked. A steel-armored submarine cable carries power to the motor which is enclosed in a case filled with high dielectric oil to protect it from contact with the water, and to provide thorough, lasting lubrication. While oil can be added from the surface, many SUBMERSIBLES installed more than six years ago have operated continuously without even this slight service.
The economical, dependable SUBMERSIBLE will solve your own problems; no obligation is incurred by sending the coupon.

Established 1872
BYRON JACKSON CO.
Factories at:
Berkeley & LOS ANGELES, California
Bethlehem, Pennsylvania
Sales Offices at:
New York - Pittsburgh
Chicago - Atlanta
Fort Worth - Houston
Salt Lake City - Fresno

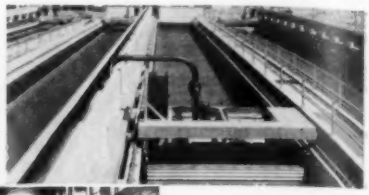
SEND TODAY FOR THIS ILLUSTRATED BROCHURE

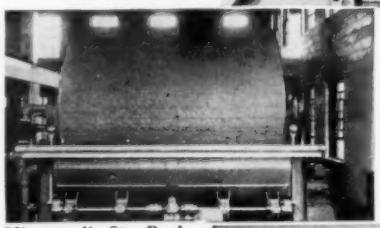
BYRON JACKSON CO. Dept. M-13
P. O. Box 1307 Arcade Station
Los Angeles, California
Please send SUBMERSIBLE brochure and large cross section drawing.

Name .....
Position .....
Address .....

Automatic Magnetite Filters for Clearer Effluents; Conkey Vacuum Filters for Sanitary Sludge Disposal, the Choice of Cities Leading in Sanitation.

Denver, Colorado.
6—12′ x 200′ downflow Magnetite Filters now in operation for straining both plain settled and chemically treated effluent. Consulting Engineers, Black and Veatch, Kansas City.

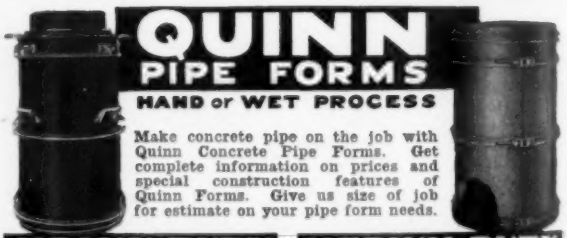




Auburn, N. Y.
One of the 2 Conkey Rotary Vacuum Filters now operating on plain settled and chemically treated sludge. Thomas Bowe, Consulting Engineer.

Minneapolis-St. Paul—Sanitary District.
8—16′ x 245′ downflow Magnetite Filters — for straining both plain settled and chemically treated effluent. C. C. Wilbur, Chief Engineer; George J. Schroepfer, Assistant Chief Engineer; W. N. Carey, P.W.A. Project Engineer.

FILTRATION EQUIPMENT CORP.
10 East 40th Street *Sales Office* New York, N. Y.
Coarse Screens - Automatic Magnetite Filters - Conkey Vacuum Filters



QUINN PIPE FORMS

HAND or WET PROCESS

Make concrete pipe on the job with Quinn Concrete Pipe Forms. Get complete information on prices and special construction features of Quinn Forms. Give us size of job for estimate on your pipe form needs.

HEAVY DUTY

Built for more years of service —sizes for any diameter pipe from 12 to 84 inches — any length — tongue and groove or bell end.

MEDIUM DUTY

Makes same sizes pipe as "Heavy Duty" but built to meet demand for lower cost equipment to produce uniform quality in smaller amounts.

Also manufacturers of concrete pipe machines for making pipe by machine process.

QUINN WIRE & IRON WORKS 1623 12 St. Boone, Iowa

RENSSELAER VALVES COREY HYDRANTS

Tapping Sleeves, Tapping Valves, Crosses, Split Repair Sleeves, Post Indicators, Floor Standards, Air Valves, Valve Boxes, Grease Cases, Etc.

Write for Catalog "C"

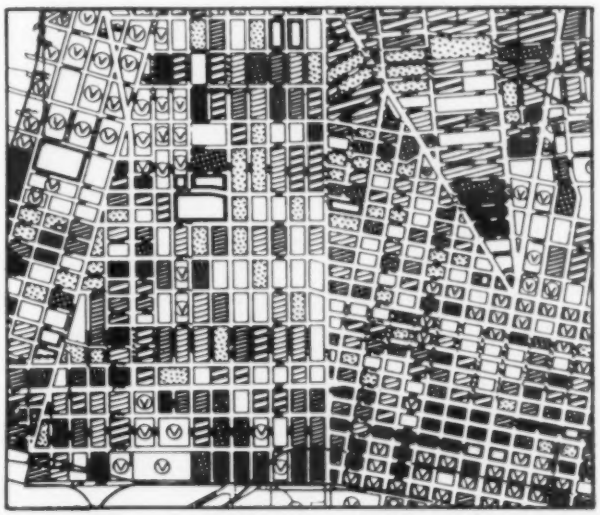
RENSSELAER VALVE CO.
TROY NEW YORK

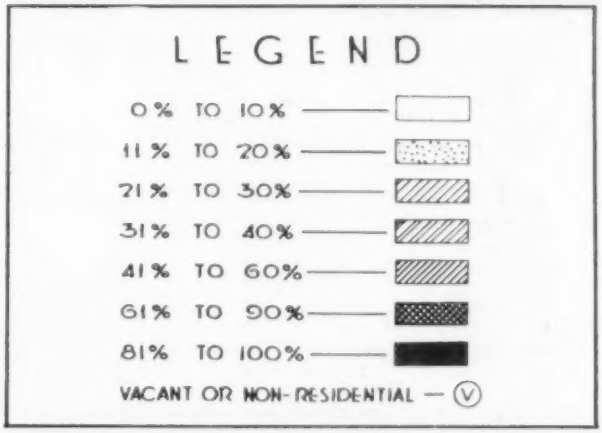
Oakland Faces Housing Facts

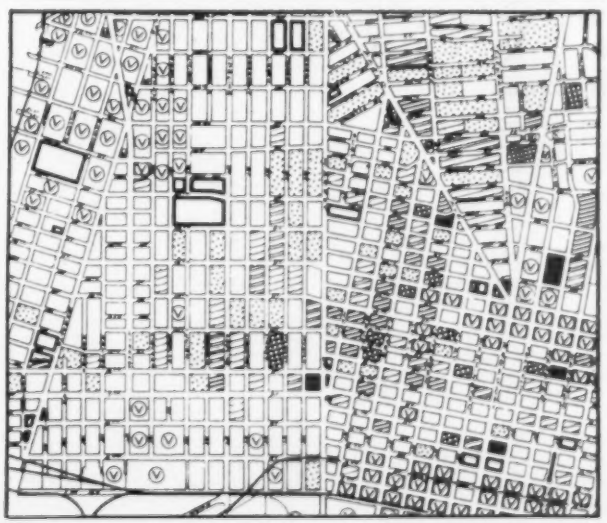
CITIES are becoming increasingly self-conscious of the deplorable state of the dwellings in which many of their citizens are forced to live. Some still say, "*We* have no slums," but others have found the courage to admit their blight and to begin the searching self-analysis necessary to a solution of the basic problems involved. Oakland, Calif., a city of considerable beauty and of many fine homes, is one of the few on the West Coast to have planned and completed a real property survey. Between February, 1936, and June, 1936, data were collected for Oakland, Piedmont, San Leandro, and Eden Township, Alameda County, by WPA workers under a study sponsored by the Oakland City Planning Commission and directed by the Planning Engineer, I. S. Shattuck, and have been subsequently mapped and tabulated for the publication which has recently appeared.

The survey provides descriptive information on residential structures and the dwelling units within them by block, by census tract, and by economic area. It indicates the type of construction of dwellings, their condition and age, the presence or absence of modern conveniences such as plumbing and central heating, and the number and race of persons occupying them. Studies are also included of those areas where there is a high rate of juvenile delinquency, a high tuberculosis death rate and a large number of contagious diseases—demonstrating that they correspond to areas of high overcrowding and structural deterioration.

All material presented in map form is contained in "Graphic Analysis," Volume II of "1936 Real Property Survey." Small sections of three of the maps are reproduced on this page, showing by block the distribution of juvenile delinquency and unfit dwellings in the same bad area. On such a study as this, the city of Oakland can plan a progressive program of repair, demolition, and rehousing.







LEFT—NUMBER OF JUVENILE DELLINQUENCIES, 1931-1935 INCLUSIVE. TOP—PER CENT OF RESIDENTIAL STRUCTURES PER BLOCK NEEDING MAJOR REPAIRS AND UNFIT FOR USE. RIGHT—PER CENT OF DWELLING UNITS PER BLOCK WITHOUT PRIVATE FLUSH TOILET OR BATH

Oakland, California, Real Property Survey

VALVES & FITTINGS

M. & H. Waterworks products conform to the latest specifications of the American Water Works Association—designed for strength, efficiency and durability.

FIG. 26

FIG. 67
A.W.W.A.

Fire Hydrants and Valves are approved by Underwriters Laboratories and by the Associated Factory Mutual Fire Insurance Companies.

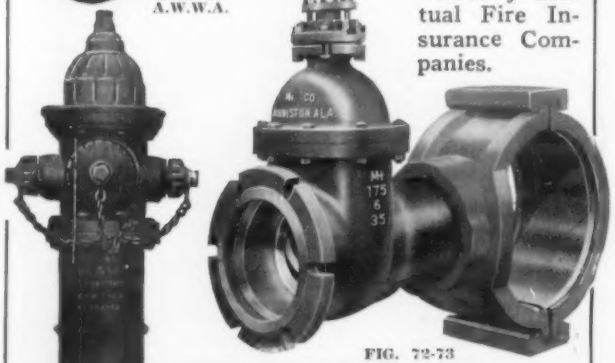


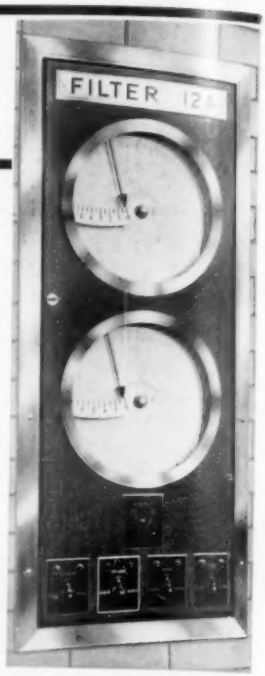
FIG. 72-73

Write for Pamphlet 31S
A.W.W.A. GATEVALVES AND FIRE HYDRANTS
M. & H. VALVE & FITTINGS CO.
ANNISTON, ALA.

FIG. 20H—
A.W.W.A.

FIG. 74-75

40 of These Panels Control Cincinnati's Filtering Operations



This filter control panel is one of forty in the new Cincinnati Water Purification Plant. Each contains a Cochrane Flow Rate Recorder and a Cochrane Loss-of-Head Recorder, together with switches for the electrical operation of influent, effluent, wash water and sewer valves.

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MOHAWK ASPHALT HEATER CO.
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Incinerators for Garbage and Refuse Disposal*

By ALDEN E. STILSON
President, Morse Boulger Destructor Co., New York

THE construction of an incinerator, depending as it does upon the use to which the incinerator is to be put, necessarily commences with design. There are various commonly used design factors which are worth consideration: first, the analysis of the fuel; second, the quantity of heat units likely to be present at normal ratings; third, the desired working temperatures which should be maintained; fourth, the probable weight to be handled per hour as an average, as a minimum, and as a maximum.

Analysis of Fuel

We believe that, rather than analyzing the fuel as to rubbish and garbage, and arbitrarily setting up a plant on this basis, it is wise to break the rubbish down into its probable component parts and, having done so, to estimate the weight of small wood, timber, paper, rags, etc. In like fashion, the garbage is analyzed as to its component parts, such as citrus fruit and banana stalks, and cooked materials, including pulp and paper pulp. With this more or less qualitative analysis in front of us, we are then in a position to estimate the ultimate analysis, which should show water, volatile or hydrocarbon, fixed carbon and ash.

Before proceeding to discuss analysis further, we should like to discuss the rationality of such an analysis in the face of the fact that garbage and rubbish are commonly thought to be a heterogeneous collection.

We know that in a given town we have a given number of people—rather fixed in their eating habits and in the quantities of calories needed for bodily comfort. It is reasonable, then, to expect that these people will produce an average percentage of waste as a result of their food preparation; waste which will vary in its water content rather than in the amount of combustible and incombustible material. The water variation, of course, results from the seasonal appearance of fresh vegetables or canned vegetables. The water content from this source, however, is not a serious thing. At best, a pound of water will not require more than 1600 to 1700 Btu for its conversion to steam at or above 1250, which is a reasonable minimum temperature for incineration.

The rubbish from a town tends to be rather constant, so far as the householder is concerned. Fortunately for us, when the weight of water from the kitchen garbage is highest, it almost certainly follows that the weight of the rubbish will be at its maximum, owing to the following causes:

1. Green vegetables appear in the summertime, when people have no furnace fires and not many cook-fires to consume the rubbish as it appears.

2. The industries of the town, in most instances, produce a regular and uniform quantity of refuse. This is due to the fact that there seems to be in all manufacturing an irreducible amount of waste directly proportional to the number of units produced. Seasonal variations of course affect industry, but in the summertime, late spring and early fall industry is normally at its highest speed of production. This being true, its rubbish output is highest in this period when the water content of the garbage from the town is at its maximum. It appears, then, that, taken over the period of a year, the relative rate of production of rubbish and the water in the garbage tend to offset each other and balance.

As one incinerator company, we have discovered that it makes little difference at what time of year we test a plant. Invariably, we find that our unit meets the test requirements. I think this fact will be substantiated by others in the industry and, if so, how can we account for the uniformity in results, regardless of the season, except that there is a rather definite relationship between combustible and water which may be counted on with reasonable certainty?

Design

Thus we have something of value on which to base our work. The analysis, if it is trustworthy, is extremely valuable in the following directions:

1. We may with certainty decide for or against a preheater.

2. We may decide how much grate area is required.

3. We may specify with confidence the amount of air that will be required for reasonably complete combustion.

4. We may size our gas chambers and flues, and with reasonable accuracy determine the height of the chimney.

The only thing the analysis will not help determine is the volume of the firing chamber into which the materials are introduced. It is possible, however, to come close to a

* EDITORIAL NOTE.—A paper presented as one of a series before the Sanitation Group, American Society of Mechanical Engineers, and printed by permission of the Society and the author. This paper is written from the viewpoint of persons interested in the entire field of incineration, not limiting the scope of the discussion to municipal work only. Furthermore, the object of the author is not to discuss large city incinerators to the exclusion of the town and village incinerator, which to the persons concerned is every bit as important as is the large incinerator to the great city. The author states: "If cities, towns and villages are to keep their refuse-disposal costs within bonds, it is likely that the municipal authorities will find it more and more to their advantage to encourage industry to build its own incinerators. From every standpoint this is best economy. The industry operating the incinerator saves storage space otherwise required between collection trips of city vehicles. Also, the heat liberated can find an economical value in the form of steam or, in certain instances, direct heat within the industrial plant proper. The city, of course, saves for the obvious reason of lightened collection schedules and a lower first cost, as well as in the operating cost in the municipal plant."

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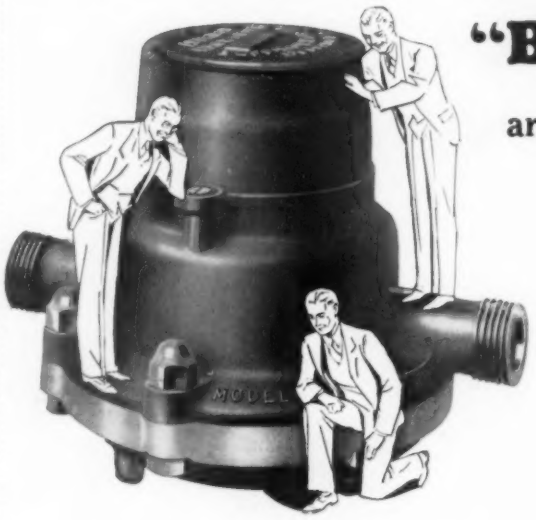

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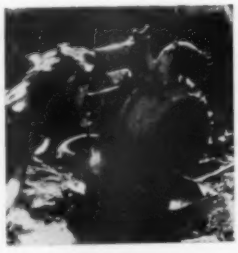

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proper sizing of the firing chamber by noting that an average mixture of garbage and rubbish in a given town will have a reasonably constant weight, which in our experience has varied from 18 to a maximum of 25 pounds per cubic foot. In our designing we like to use the figure 18 pounds per cubic foot. Knowing the amount of ash present, we allow for it on the basis of about 20 pounds to the cubic foot, multiplied by the number of hours the operation is to continue without cleaning down the furnace or dumping the grates. We are in a position to ascertain the probable depth of ash expected in the last unit of time before dumping, and still operating at normal rated capacities. In this fashion we have built up a definite volume of material that is to be found upon the grates.

Design of Firing Chamber

The next question in connection with the design of the firing chamber is, then, to determine what operating temperature we expect or desire there. It is our own feeling that we should strive for a temperature of about 1300 to 1400 degrees in this chamber. Knowing from the analysis the amount of air required for complete combustion, and knowing also the effective draft which we desire to have over the top of the garbage in the unit, we are in a position to calculate the amount of air that will be required from the fan under the worst conditions, and the amount of air that will probably enter the unit during charging operations. The size of the chamber can be readily determined from this information: the quantity of air plus the quantity of combustible and water multiplied by the volume of gas at 1400° F. and divided by the velocity of gas desired.

It is a common thing to note stratification of gases within an incinerator firing chamber. This stratification, unless mechanically broken up, will not change appreciably and is a common cause of smoke out of the top of the chimney. In the interest of good incineration, therefore, whenever opportunity allows us to do so, we interpose between the firing chamber and the combustion chamber what we choose to call a mixing chamber and primary combustion chamber. In this chamber we try to force the gases downward and back, at the same time introducing secondary air under control. We do this at a comparatively high gas velocity. The value of the mixing chamber as a means of agitation cannot be denied. The value of having secondary air introduced at this point we believe is so obvious as to need little or no explanation. One self-evident justification is to be found in the fact that when, owing to unforeseen circumstances or exceptional overload, the grates are so heavily blocked that air cannot enter through them, then the presence of the secondary air supply immediately appeals to all engineers as an absolute necessity.

The Combustion Chamber

The analysis of the materials giving the amount of water, combustible and heat units as a result of knowing the combustible also gives the amount of air required for combustion by reason of the division of the combustibles into fixed carbon and volatile carbon, and makes it possible to design a combustion chamber that will heat up and glow, a condition which is a delight to all incinerator builders' hearts. The phenomenon of black combustion chambers is a bugbear, and we all know the bad results obtaining. A mechanical engineer appreciates what causes the black combustion chamber; normally, the average incinerator owner does not.

As a mechanical engineer will tell you, the temperature within a chamber is a direct function of the number of heat units present and the velocity of the gases through the chamber. CO_2 readings under various conditions of the combustion chamber indicate part of the story. Almost invariably, CO_2 readings under full operation of a modern incinerator range from a low of 4.5 to an average of about 7, to a maximum of about 10 per cent. One difficulty, then, seems to be the inordinate amount of excess oxygen and air which has been allowed to enter or which has been forced into the mass. The condition can be cleared up partially, therefore, by controlling the air supply so that the CO_2 will run somewhere around 7 to 10 per cent, at which condition it is noticeable that there is no smoke issuing from the chimney. The designer, however, can help this situation if he will turn back through his files of *Power Plant Engineering* from February through December, 1935, and February through September, 1936, and examine the excellent articles on relative heat release for given temperature in a furnace.

It will be noted that a heat release from 15,000 to 22,000 Btu per cubic foot of furnace chamber volume gives best results in the pulp and hog fuel furnaces. Our own experiments in furnaces we have built indicates that this range is desirable for best incineration results.

Almost all garbage and rubbish, with the exception of trade wastes, is of vegetable origin. It is therefore, in our judgment, proper to apply Du Long's formula. This formula indicates an approximate heat value of about 8,000 Btu for the ash and moisture-free combustible in a vegetable fuel. Destructive distillation and analyses of garbage and rubbish, coupled with bombshell calorimeter tests, bear out the truth of this method of determining heat values for garbage and rubbish.

A series of 25 tests run by us show a range of from 7,500 minimum in one or two instances to a maximum of 9,000 to 10,000 in certain other instances, giving an average of 8,500 as being safe. We have adopted 8,000 in our own work, and shall be interested to know what others have concluded to be a proper figure. Please note, however, that we always estimate on the basis of *ash and moisture-free combustible*, and where we are dealing with uncooked vegetable matter, we always allow for the presence of volatile carbon in a percentage of 35 to 40 of the total carbon present.

Having the analysis, we are of course quite anxious about the amount of air required for combustion. We find that, theoretically, it ranges from 11 to 13.5 pounds per pound of ash and moisture-free combustible. This finding is made on the basis of an ultimate chemical analysis of what we believe to be representative material from municipalities. We note that when the total air is in about the proportion of 18 to 20 pounds per pound of ash and moisture-free combustible, we get the best incineration results. These relative weights will indicate a CO_2 reading of from 9 to 10 or 11 per cent as an absolute maximum. When we get higher than 11 per cent CO_2, we go back to a smoke condition in the chimney, meaning that, despite our efforts to break up stratification, and even with

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3

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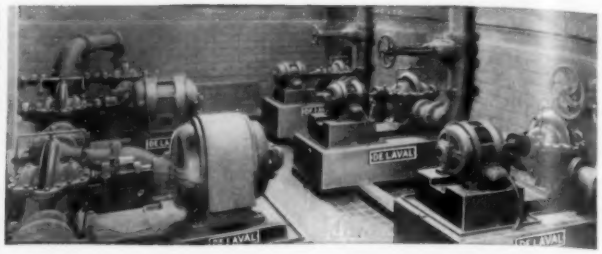

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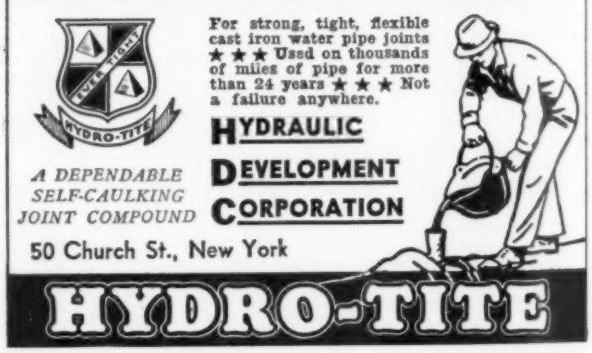

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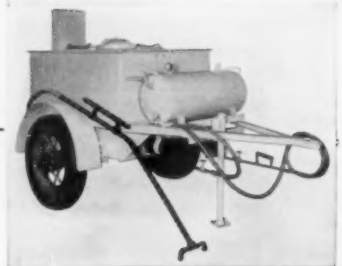

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the introduction of secondary air, we are approaching the critical point where the very presence of the moisture being given off is able, by its relative increase in weight, to defeat the unburned carbon in its quest for the oxygen we are trying to give it. It appears then, from what we have said, that the analysis and knowledge of the heat available in our rubbish and garbage is of prime importance to us, at least. We assume that it probably is to others who are designing in the field.

Auxiliary Fuel

The desired temperature, we discovered, can be reasonably assured if an analysis is available, and the unit may be designed for that temperature. It is of course self-evident that if the analysis shows an insufficient number of heat units present to create a desired temperature, or where adverse weather conditions bring large amounts of water to the garbage and rubbish, then on plants of 75 tons or better a preheater may be used to help. If the preheater is not sufficient aid, or in the event that the plant is too small for a preheater to be economically installed, we like to use soft coal. We like to use the cheapest kind of soft coal. We do not like to use oil or gas, particularly on furnaces of over one ton capacity per hour.

Perhaps an explanation of our dislike for oil and gas should be made at this time. To begin with, it is very difficult to get the heat from oil or gas applied where it is needed. Oil and gas also tend toward laxity and carelessness on the part of the operator, who finds that by simply turning valves he can get his fuel and resultant incineration without much bodily cost. The result is a high cost for the owner.

Almost invariably where we discover that additional fuel is going to be required, we deliberately design our furnaces for its use and deviate widely from the conventional idea of municipal incinerators. Here is where we use what we call our "G"* type or our "S"* type. These two units we believe to be the most efficient as fuel users. Our belief is based upon actual experience in operation.

The unit we are today seeing more and more of in municipal incineration is what we term our modified "G" and in certain instances our "A,"* which is even less efficient as a commercial fuel user. Be it noted that our "modified G"* and our "A" type are both in their larger sizes commonly called the mutual assistance cell type of unit, which in our judgment is the best type of furnace for comparatively dry municipal refuse at present on the market.

Construction

So much has been said relative to design factors that possibly the subject of construction should be skimmed over, if only the feelings of the audience are to be considered.

Be it said to the credit of everyone engaged in incinerator design that all are striving for the best in materials. Differences of opinion herein expressed as to which is best are then entirely a personal matter, with our company. We do not ask you to accept them without controversy, but we are glad to tell you our opinion.

We like a refractory material that has the following analysis: a spalling test conducted at 1600° C. should result in an average spalling loss of less than 1.5 per cent. This is the A.S.T.M. spalling test. We like an analysis approximately as follows:

PCE—32
Silica—57 to 58%
Alumina—35 to 36%
Iron oxide—2.75%
Titania—approx. 2%
Lime magnesia and alkalies—less than 3%

This is demanding specification, but it is something that we know gives results, and we have confidence that this specification or better as a standard will give the eventual owner a unit of which he may well be proud. This analysis and character of brick we use only in ordinary garbage and rubbish work. We do not use this in our heavy industrial units where we can reasonably expect temperatures in excess of 2400 degrees. Where we are faced with exceptionally high temperatures, we go to such brick as A.P. Green "Mexico" or Laclede-Christy "Spallac," and in addition make use of water-cooling the refractories as a further means of saving them. Several of our installations are being equipped with armor-clad water walls as bridge walls and baffle walls. Be it noted here, however, that these uses are only found where we are operating at temperatures ranging from 2600 to 3,000 degrees.

In designing for these high temperatures, we are extremely careful to proportion our heat release to furnace volume, and to provide for the extreme amount of kinetic energy we may expect in gases being released at such a temperature. Actually, some of our furnaces are operating under conditions of almost continuous explosion.

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* AUTHOR'S NOTE.—The Morse Boulger Destructor Co. has any one of several designs to offer the city, town or industry needing an incinerator. In this paper we have mentioned the "G," "S," "Modified G," and "A" types.

The "G" type has a preponderance of refractory hearth with a comparatively small area of cast iron grate. The grates are used for the combustion of such limited amount of dry material as may be available for fuel. The hearth supports the garbage directly in the path of the heat and flame liberated by the dry rubbish and the fuel. It presents a large surface for the evaporation and burning-up of the garbage or wet materials. The gases pass downward through and over the end of the upper hearth only to strike a hearth immediately beneath.

On the hearth beneath we find those drier portions which have trickled down through the refractory hearth slots or gone over the end of the upper burning hearth. These materials act as incandescent media for re-igniting any mixture of unconsumed carbon gas, which, having been mixed with air in its 90-degree vertical downward travel, may need re-ignition. Again, the gases from the lower half turn vertically downward and sweep along the floor of the third pass to the settling chamber at the rear of the furnace.

In this unit, then, exceptionally long gas travel at high temperatures is invited. Carburization of gas-air is accomplished, and when extremely wet materials, such as pea soup as an extreme, are poured on to the upper hearth, they are prevented from mixing with the ash as they would mix were they on the cast iron grates, and as a result are consumed, giving a very sterile ash as the final resultant of incineration in the "G" type. The "G" type offers high efficiency for the incineration of wet materials.

The "S" type is used for sewage screenings and in its essentials is a close approximation of the "G" type which is used for straight garbage with very little rubbish.

The "Modified G" type is used for average city work, and is strictly a mutual assistance cell type of unit, which Mr. Hersey has discussed in his paper in some detail.

The "A" type is a distinct modification of the mutual assistance cell type and is used for readily combustible mixtures of garbage and rubbish which burn without the need for excessive gas travels and care in handling. In this type the gases simply pass over a bridge wall and into the combustion chamber, which is in distinction to the "Modified G" type, which has the primary mixing chamber, as discussed in the main body of this paper. This unit is satisfactory for smaller installations under the size which would normally require preheaters.

We hope that the readers of this paper will understand from this addenda to the main body of the paper, that the Morse Boulger Destructor Co. at least does not believe that the entire municipal field can be properly taken care of with only a single type of unit.

ALDEN E. STILSON,
President, Morse Boulger Destructor Co.

The MORRIS HYDRAULIC COLUMN

News of interest to Centrifugal Pump Users

Such popularity *is* deserved . . . . .

The water department superintendent in a representative North Carolina city recently asked us where Morris Centrifugal Pumps were installed in his state. We accordingly looked up the orders we have recently received for water supply, sewage, and filtration plant pumps, and found that the following North Carolina communities had purchased Morris Pumps:

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Belmont	Elizabeth City	High Point	Oxford	Salisbury
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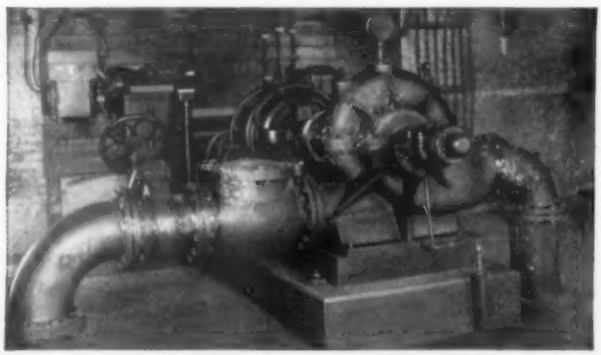
The features that have made Morris Pumps widely popular all over the country, as well as in North Carolina, are described in bulletins which will interest every pump user. Write for your copies.



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RITE-HITE Valve Box Tops are semi-steel one-piece castings and are used for raising or lowering the height of old valve boxes without disturbing the paving.

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Temperature readings were taken during a recent test of one of our industrial units, at a point measured in lineal feet of gas travel, approximately 28 feet from the fuel bed after the gases had passed through and between water walls and under water-cooled arches, and were taken against the face of the tubes of a water-tube boiler. The temperatures ranged from a minimum of 2152° to 2400° F., with a maximum of 2600. The firebox temperatures ranged during this time from 2700 to 3200, using an optical pyrometer with accuracies plus or minus 50° F.

Incidentally, the CO_2 reading at 2400 degrees was 7 per cent in one instance, ranging up to a maximum of 10.5 per cent, and an average over-all 7 to 8 per cent was usual. At this time the excess air was in the amount of 121 to 118 per cent more than theoretical.

This furnace, burning about 5,000 pounds per hour of material containing from 35 to 45 per cent of metal, and some rubber, was generating steam at the rate of 23,000 pounds per hour or on the basis of ash and moisture-free combustible present, generating approximately 7.5 pounds of steam per pound of combustible.

We have come to the conclusion, in connection with larger municipal furnaces, particularly in any case where we have to withstand extreme temperatures of 1500 degrees and over, that the flat arch is to be preferred. We do not advocate exceptional depth in the flat arch, because we do not think they are justified in the increased amount of wear given. Generally, we like an arch having at least 7 inches of refractory beneath the hanger. We are quite sold on the value of large blocks, and in connection with flat arches we are very much sold on the use of special refractory blocks for the charging hole sets. Wherever possible, we like these to be made of extremely spall-resistant materials. We are not sold on the use of carborundum or air-cooled metal jambs and door arches. We believe that a good fireclay molded into large blocks to form the door set gives the best results for the least expense, both for initial installation and from a maintenance angle.

We are much interested in the possibilities of hung walls, particularly for those walls which are comparatively high.

We think that the flat-arch people are to be commended for their perseverance in connection with incinerators, and we hope they will continue.

Insulation of Incinerators

The subject of insulation in incinerators, we believe, has been over-stressed. We are quite certain that where brick exterior walls are used best results from the refractories and over-all efficiency of the furnace are obtained where a 3-inch air space is provided between the back of the refractory and the exterior wall. We do not claim that this gives much preheat to the air which is carried through the walls and then conducted into the furnace, but we do know that to substitute insulation for the air space results in a lowered life of the refractory, and that the insulation is allowed to account for values in heat balances to determine fuel requirements which are not justified in most instances. Insulation in connection with steel-jacketed furnaces is of course practically a necessity. However, we believe that even here an air space, in addition to the insulation, between the incinerator's insulated shell and the refractory will be of definite benefit to the life of the refractory.

In connection with hung walls and flat arches, insulation must of necessity allow for air to circulate freely around the metal hangers unless disaster is invited.

We are decidedly on the fence as regards the relative value of the carborundum preheater and a properly designed down-draft cast iron tubular preheater. We are of the opinion that better results at approximately the same cost can be derived from the cast iron preheater than from the carborundum preheater, and we know that when repairs are necessary in the carborundum preheaters the costs are in favor of the cast iron.

We desire to go on record definitely against refractory preheaters other than carborundum, and also very positively against the use of horizontal tubular preheaters or updraft metallic preheaters in connection with incinerators where no boiler is interposed between the preheater and the furnace.

We are of the opinion that in smaller plants—by this we mean under 75 tons capacity—the use of preheaters is not economical, basing our information on estimated capital charges for the additional building, flues, and cost of the preheaters. We believe that in these instances soft coal is the better fuel to use, and that the cost of the coal will be less than the capital charges incidental to the preheater.

It is our opinion that the use of No. 1 gray cast iron, which is tough and free from flaws, is better for grates and general use about the furnace than high-temperature steels or cast iron alloys.

We condemn the use of high-temperature cement in erecting furnaces. In our judgment, a properly designed and constructed incinerator should be able to function if it had no fireclay mortar within its body. The use of high-temperature cement leads to poor workmanship and furnace failures that would otherwise be avoided. We particularly object to air-setting high-temperature cements on the ground that they are almost invariably adulterated with sodium silicate or other air-setting binder. These binders quickly form a eutectic with the materials in the brick and cause glazing and fluxing. The average high-temperature cement contains some metallic substance other than aluminum oxide which fuses and fluxes with the brick.

We advocate strongly that a thin slurry of ground fireclay with a small amount of ganister added is all that is required in laying up firebrick, and that this slurry be used only as a thin soup and not as a mud, and that all brick be tapped and shoved into place with a close clearance between the actual brick.

We condemn the use of monolithic refractories. They cannot of necessity be without shrinkage when the water leaves, and their stress failure points are lower than are right for incineration work. We contend where sprung arches are used, or wherever brickwork is being installed which will be subject to expansion and contraction, that the joint plane between brick may best be determined by mathematical calculation of an approximate perpendicular to the line of the catenary which passes through that arch at that line and that such effort will result in a high degree of satisfaction from the standpoint of stability. Failure to take into consideration the lines of stress in the placing of joints in brickwork accounts for a major portion of spalling and structural collapse.

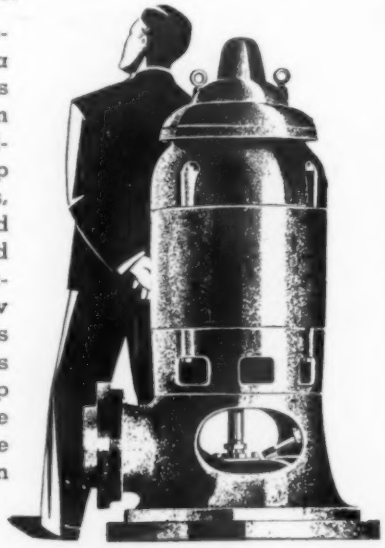
We believe that where it is possible to construct a large shape to take the place of a multitude of small standard

ASK ANY POMONA OWNER

This is a good tip for anyone who is in the market for a turbine pump. After years of service—the owner of any pump can properly appraise its performance.

Ask any Pomona owner and you usually get a stronger endorsement of Pomona satisfaction than we ever dare to put into an advertisement. Such recommendations have spread through every industrial, agricultural, municipal and mining district in the world, with the result that the two Pomona factories represent the largest area and capacity in the turbine pump industry. In these factories Pomona Pumps are made—under strict engineering and fabrication control—to our own exclusive designs and with modern machinery, much of which is exclusive.

One of the big safeguards in owning a Pomona Pump is that it comes from factories that specialize entirely on deep well turbine pumps, mine pumps and drainage and flood control pumps — factories that know pumps and wells and the requirements of all classes of pump users. From these facts comes the world leadership in number of Pomona Pumps BOUGHT.



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Oceans of Water

POMONA TURBINE PUMPS

Cast Iron Pipe

PLAIN CAST OR SPUN CENTRIFUGAL

Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials, Threaded End Pipe.

Size 2 to 84-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

Warren Foundry & Pipe Corp.
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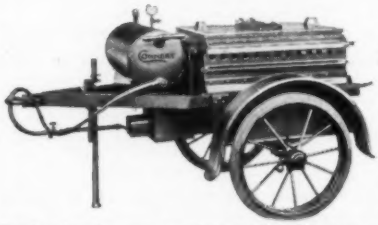
CONNERY'S TAR & ASPHALT HEATING KETTLES



Style "J" 60-75-gallon oil burning kettle equipped with Timken Bearings, solid rubber-tired wheels and truck springs. A fine kettle for maintenance work and the price is low.

All sizes manufactured from 10 to 550 gallons.

Send today for our complete catalog showing our full line of Tar and Asphalt Heating Kettles, Spraying Attachments, Pouring Pots, etc.

CONNERY CONSTRUCTION COMPANY
4000 North Second St. Philadelphia, Pa.

PROPER HOUSE NUMBERING

There is a right and a wrong way to plan house numbering in a city. Send for special report compiled by authorities on this subject. No charge, of course.

Premax Products

Diversion Chisholm-Ryder Co. Inc. 1938 HIGHLAND AVE. NIAGARA FALLS, N.Y.

brick, longer life results in the structure, for two reasons: (1) expansion and contraction does not tend to loosen up the brickwork, since there are fewer joints; (2) with fewer joints there is less opportunity for foreign materials to get into the cracks and flux, or by reason of their variance in expansion and contraction coefficients, spall and break out the brick.

We believe that brick in incinerators invariably receive stresses which are not calculated by the designer. It has been found through our own experience that about the maximum thrust allowable at temperatures in the neighborhood of 2,000 degrees is 58 pounds per square inch, and that where this compressive stress is exceeded, the brick do not stand up.

Specifications

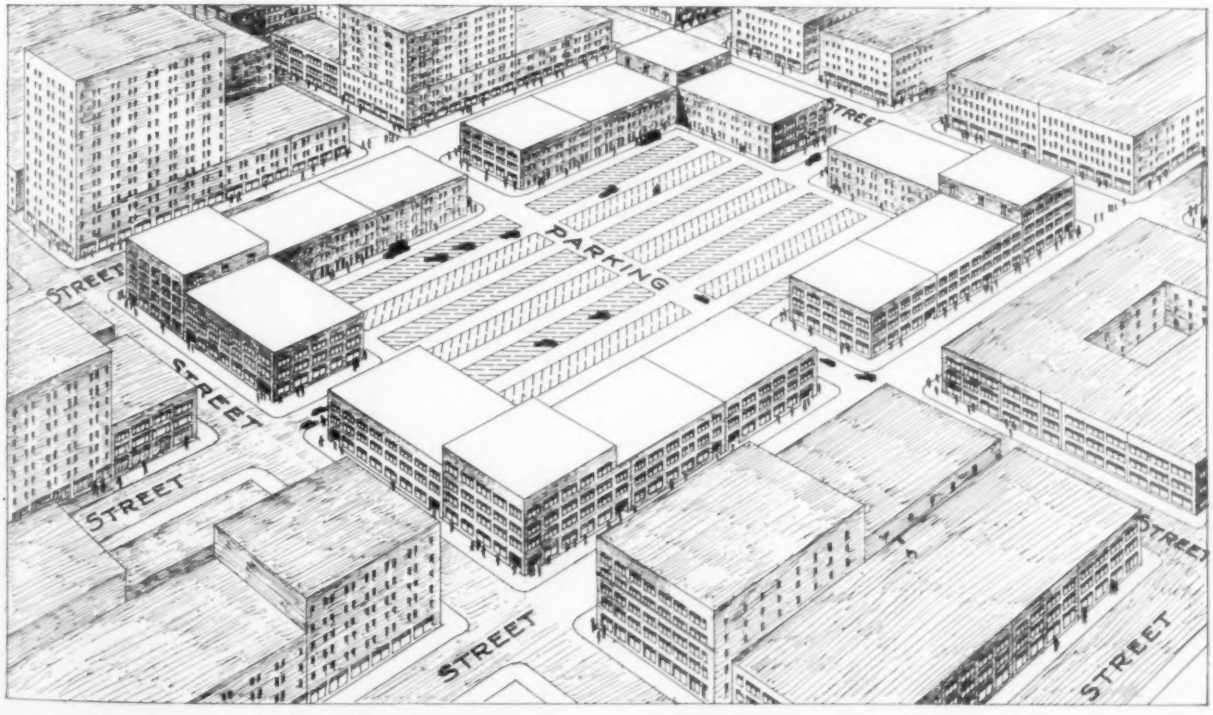
In conclusion, as a contractor, our company would like to address itself to the engineering profession. We submit that essentially all the builders of incinerators are sincere in their wish to improve their furnaces from the standpoint of design, construction and operation. We believe that through the years we have contributed something to the art of incineration. We respectfully invite your assistance and encouragement. This assistance and encouragement to better things may best be given by stating the results which you want to obtain and leaving to the individual incinerator contractor as much latitude as your unbiased judgment permits in the matter of detail of design and type of materials. Please note we do not ask you to forego specifying arrangement, quality, and architectural values which you wish to obtain. We think that in these respects your efforts to acquire high standards and comparable values is distinctly an incentive which we all need.

We further request as a company that engineers be more firm in the support of those contractors who offer improvements, higher-quality materials and otherwise desirable features which engineering judgment indicates will be of value to the owner. By being more firm in the support of the contractor, the engineer will encourage incinerator contractors to try to better their work, rather than try to cheapen it, which results from the effort of the owner to buy at the lowest possible price.

No Mystery in Incinerators

In closing, we should like to say that incinerators are not a mystery; there can be no magic in connection with them; they are common-sense applications to a problem which is increasingly important. We sincerely hope that as the members of our profession have occasion to study incinerator projects they will give out their suggestions, criticisms and commendations without hesitation.

Eliminate the Parking Toll



The most vital neglect from which downtown Milwaukee is suffering is the lack of providing parking places for the customers' autos. In consequence, many people have seized the opportunity of collecting toll privately for parking space. It is estimated that between the hours of 6 A.M. and 6 P.M. the downtown business demands an annual parking tariff of $1,233,739. This depreciates the value of downtown property and impairs the city's and the county's income. With the auto, distance is no longer a serious factor, and the need for congestion grows constantly less. Downtown Milwaukee will require fewer buildings with much more space between them. Owners must agree to a city plan which provides a series of parking parks. Within a checkerboard street plan, four of the blocks may each contribute toward a central parking area, as pictured above. To be efficient, each parking center must be connected with an artery in a manner that will induce private investors to improve surrounding buildings, but care must always be exercised to restrict the capacity of the buildings to balance the need for auto space by those who frequent the buildings surrounding each parking area. This type of reconstruction to insure the efficiency of downtown Milwaukee should render it capable of serving as a radial center for the whole of southeastern Wisconsin.

C. B. WHITNALL.

20 Years of Service for this Original Concrete Surface

—AND THE UPKEEP? Just Sealing the Joints

Main Street, Newport, Vt., paved with concrete in 1917. Width varies from 35 to 48 feet; thickness from 6 to 8 inches. J. O. Goodrich was the engineer in charge of construction.

Twenty years ago, Newport, Vermont, paved Main Street with concrete. Since then much additional concrete has been laid because of the splendid service record of the original paving. Here's what James T. Gardner, present State Senator and former Mayor and Alderman of Newport, wrote us about it in November, 1937.

"Despite all the heavy traffic that has used the 20-year-old concrete pavement, and despite, also, our sometimes 50-degree sub-zero temperatures in winter, the pavement is in excellent condition today. Furthermore, the upkeep has been very low, consisting solely of sealing the joints every year or two.

"At the time it was being debated what kind of surfacing to lay on Main Street, there were some citizens who voiced preference for a pavement costing less to build than concrete. But today no one questions the wisdom of selecting concrete. The economical service it has given is apparent to all.

"A cheaper type would probably have required a number of new surfaces by now, not only thus boosting out of sight the upkeep expense, but also interfering greatly with business on this street."

PORTLAND CEMENT ASSOCIATION

Dept. A4-4, 33 W. Grand Ave., Chicago, Ill.

A National Organization to Improve and Extend the Uses of Concrete

THE MORE CONCRETE THE LESS STREET MAINTENANCE

Do you mention THE AMERICAN CITY? Please do.

Forward Steps

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

ANIMAL SHELTER, PALO ALTO, CALIFORNIA

A Modern Animal Shelter

PALO ALTO, CALIF.—This city of 13,635 inhabitants recently completed a $17,000 Animal Shelter which is truly a forward step in the humane method of caring for domestic animals—waifs of circumstance which abound in every city.

The wedge-shaped building of white stucco, with red-tiled roof and green trim, is of Spanish-type architecture, and has an attractively landscaped setting. When additional funds are available, a 7-foot hollow tile wall will enclose the structure, thereby excluding any irregular intrusion.

The interior of the building is neat and simple in design, giving an atmosphere of cheer and restfulness. The entrance lobby, or reception room, is appropriately equipped with modernistic metal furnishings, and is generously supplied with magazines and pamphlets pertaining to the care of pets. The walls in this room have been finished with plaster board to permit the display of colorful and instructive posters to educate school children in animal lore. The business office is in the left end of the lobby, closed off from the main room save for an open counter.

Back of the office, and forming the front end of the left wing, is a completely equipped kitchen, adjoining which is a small pantry where bins of rations are stored. Centering in the left wing, a small room houses the heating system. It is a compact automatic Watrola, which operates in three units—for kennels, administration building, and the small-animal ward. The unit plan reduces heating expenditures, since each section can be heated as needed.

Next are the kennels, sixteen in number, housing waifs and boarders. Each kennel, or compartment, is 6 x 6 feet, and has an open-air screened yard run 6 x 10 feet. Boarders have individual runs, while waifs share them, two to four to a run. Each kennel is equipped with beds and running water. The floors are cement. Small sliding doors open or shut off each runway.

Built against the outside of this wing is the garage which houses the Shelter's truck, where damaged kennel equipment is repaired; and built into the fence, which encloses a few feet of ground in front of the garage, are half-a-dozen wooden compartments in which waifs may be placed after the business office has closed. Each compartment is equipped with food, water, and a bed, and has two doors, one which may be used and locked by the individual who places a waif inside, and the other to which only the kennel master has access.

To the right of the lobby is a receiving ward, where all waifs are bathed and de-flead before being placed in a kennel. The Shelter is not a hospital, and does not tender such services. It does, however, provide an observation ward where any dog that bites, or shows a propensity to do so, is impounded for ten days and carefully watched, after which consultation is held to determine its fate. This Shelter is not an animated slaughter-house. Some waifs are kept as long as three months.

Adjacent to the receiving ward, and forming the end of this wing, is the small-animal ward where puppies and cats are housed and boarded.

Located on city ground, the Shelter is city property, and is a self-supporting institution. It will in time pay its initial cost of construction, which materialized as follows: local Humane Society fund, growing out of donations, in the amount of $2,000; an individual gift of $10,000; and $5,000 from the city of Palo Alto.

The following tabulation for one month shows the Shelter's sources of revenue:

Dog licenses	$939.50
Redemption fees	10.75
Sales	30.00
Boarding	82.00
Destruction fees	2.25
Total	$1,064.50

There is also a small revenue from the donation jar placed in the lobby. No destruction fee is charged for animals brought in from within city limits. The city allows boarders to be taken in at weekly rates, to help defray expenses—$2.50 for cats, and $3.00 for dogs, regardless of size.

An enormous disinfectant bill accrues monthly, since the entire Shelter is disinfected daily—hosed and sprayed.

A year's budget is estimated to be in excess of $4,000. The Shelter is already within $1,000 of this mark, with half a year yet to run.

GENE DULIN.

PALO ALTO ANIMAL SHELTER

Left—Inside of dog kennels and run. Center—Outside of receiving kennel. Right—"Clinic" and bath; cat room beyond

CHEVROLET TRUCKS

again prove their great performance and economy by this A.A.A. CERTIFIED TEST RUN

CONTEST BOARD AAA CERTIFIED TEST AMERICAN AUTOMOBILE ASSOCIATION

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THIRD ANNUAL Safe Driving ROAD TEST
CHEVROLET TRUCKS "Thrift Carriers for the Nation"
COAST-TO-COAST RUN
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1938 1½-ton stock model Chevrolet truck demonstrates cost-saving performance in test run from the capital of Canada to the capital of Mexico

less than ⅓ CENT PER TON MILE

14.48 MILES PER GALLON of gasoline

NOT ONE CENT FOR REPAIRS

CHEVROLET No tests are more rigidly supervised and exacting than tests conducted under the supervision of the Contest Board of the American Automobile Association. All figures listed in the column at the right are *facts*—certified and convincing proof of the great performance qualities and dollar-saving economy of Chevrolet trucks! Modernize your truck equipment now. Save money *all ways* with Chevrolet trucks—with low first cost, low operating cost, low maintenance expense—and with rugged, durable Chevrolet construction that gives extra thousands of miles of capable, satisfying operation.

CHEVROLET MOTOR DIVISION, *General Motors Sales Corporation*, DETROIT, MICHIGAN

General Motors Instalment Plan—Convenient, Economical Monthly Payments. A General Motors Value.

READ THESE AMAZING PERFORMANCE FACTS...

Total mileage covered	3,022.2 miles
Payload weight	4,590 lb.
Gross weight	9,260 lb.
Average speed	31.04 m.p.h.
Total gasoline consumed	208.73 gallons
Miles per gallon of gasoline	14.48
Oil consumed	2.92 quarts
Total cost (gas, oil, lubrication)	$43.84
Total per ton-mile cost	$.00313

"THE THRIFT-CARRIERS FOR THE NATION"

Risen from the Tornado's Ruins

GAINESVILLE, GA.—Transformed from the wreckage left by a tornado two years ago, the old Courthouse Square of Gainesville, county-seat of Hall County, Georgia, now presents an up-to-date appearance for which credit is due the civic spirit of the city supported by the Works Progress Administration.

It was on April 6, 1936, that a howling tornado ripped through the heart of the city and caused the loss of many lives and the destruction of hundreds of thousand dollars' worth of property. Sturdy brick buildings crumbled, filling the streets with débris. The courthouse, city hall and other public buildings were left jumbled masses of masonry. Only the Confederate monument, in the center of the square, remained uninjured amid the ruins.

But soon forces of WPA workers moved in, cleared the streets, attacked the wreckage and launched a $250,000 program of reconstruction, which is now practically completed. Rebuilt into a modern and more attractive city, Gainesville now has a $60,000 city hall, nearly finished, and a new fire station, which temporarily houses the city government. A streamlined courthouse replaces the old one. The old Courthouse Square, spick and span, is now Roosevelt Square.

Other improvements, healing the storm's ugly scars, include a new grammar school for Negroes, new pavements and sidewalks surrounding the courthouse and park; extension of the city's sewerage system, and installation of white way lights in the business section.

GEORGE H. WATSON.

New Maps May Increase Water Receipts

BALTIMORE, MD.—One of the duties assigned the Bureau of Plans and Surveys, city of Baltimore, at the time of its creation, was the task of establishing and maintaining correct tax plats. While work along this line has been in progress since 1926, it would have required the present available permanent force 75 years to effect a completion, after which it could be maintained up-to-date.

Application was therefore made to the Civil Works Administration for the employment of men qualified for this work. Approval was granted in November, 1933, and the project was begun during the latter part of November, ceasing on March 31, 1934, at the termination of the CWA.

Work was resumed on December 9, 1935, through the approval of a WPA project, and the organization reached its peak in February, 1936, employing 342 men. These men search the land records for correct descriptions of the properties and the present ownership; go into the field to locate and sketch physical conditions, incorporate the findings into the tax plats and coordinate the records of the Bureau of Plans and Surveys with those of the tax assessing and collecting agencies of the city. Upon its completion,

COURTHOUSE SQUARE, GAINESVILLE, GA., IMMEDIATELY FOLLOWING TORNADO, APRIL 6, 1936

Note Confederate Monument at left, the only undamaged object remaining in the square after the storm

GAINESVILLE COURTHOUSE SQUARE TODAY, NOW ROOSEVELT SQUARE, FROM THE SAME POSITION AS ABOVE

NEW GAINESVILLE CITY HALL CONSTRUCTED BY WORKS PROGRESS ADMINISTRATION AND THE CITY OF GAINESVILLE AT A COST OF APPROXIMATELY $60,000

SERIOUS CRIMES STEADILY DECREASE IN YAKIMA, WASH.

Police Radio can get *him*

He **represents the criminals in *your* community. Statistics prove that after the installation of police radio arrests increase—crimes decrease. If you have a small area to patrol, the Western Electric 25 watt equipment is just what you need. This 22A transmitter is known for its power, clarity, simplicity of operation, low initial and operating costs. For full details on Western Electric equipment: Graybar Electric, Graybar Building, New York City.**

Western Electric Police Radio a major factor—says Police Chief Robinson

"Our more serious crimes have been steadily on the decrease since we installed Western Electric Police Radio," says Yakima's Chief of Police, Harold A. Robinson.

"On top of that, *arrests* have *increased*. In 1934, the last year before we had radio, we made 2355 arrests. In 1935, the figure jumped to 4460. We believe our department is now one of the most efficient in the state of Washington.

"We have a 1-way transmitter and four radio equipped squad cars to cover 10 square miles. Before radio, police cars were notified by a light system. Sometimes it took 15 mintues to relay one of them to the point of call. Now our radio cars' average response is between 2 and 3 minutes. Often we hear of people who call for the police—by the time they hang up the telephone and get to the front door, a squad car is there. Today we have a much more efficient and smoother-running organization—thanks to Western Electric Police Radio."

Distributed by GraybaR

Western Electric Police Radio is giving added protection to 45,000,000 people.

Western Electric

Distributed by GRAYBAR *Electric Co. In Canada: Northern Electric Co., Ltd.*

POLICE RADIO TELEPHONE EQUIPMENT

thorough and accurate tax plats on a scale of 40 feet to the inch (which can be used by all other bureaus of the city as a master plat) will have been developed.

This work also makes it possible to supply information to systematically check flat-rate water rents, with the result that a considerable amount has already been added to annual revenue, and it is anticipated that when the work is finished there will be an annual increase in revenue of about $100,000.

Another purpose of this project is the revision of the now obsolete Atlas of Baltimore, published in 1914. These maps will be of great use to all bureaus and other branches of municipal government. Upon completion of the project, it is hoped to publish an Atlas on a scale of 400 feet to the inch bound in a volume 11½ x 16 inches, which would be inexpensive, more durable, and in greater demand by the general public than the volume published in 1914.

At present, 100 men are engaged on the work authorized by this project, approximately 35 per cent of which has been completed.

EDWARD J. HECKER,
Engineer of Plans and Surveys, Baltimore, Md.

Transformer Trailer Provides Quick Service

FORT WAYNE, IND.—In the interest of providing the best service possible, the City Light and Water Utilities of Fort Wayne, Ind., has recently built a trailer containing a transformer for use in emergencies. The trailer is equipped complete with insulated cables for connection to the overhead wires. All electrical equipment is enclosed in steel and grounded so that there will be no danger of the public coming in contact with energized apparatus.

The trailer is used in the event of a transformer failure, due to lightning or other causes, and is so arranged that the entire unit can be handled by the Service Department automotive equipment, which is on duty 24 hours every day. Any damaged transformer can be disconnected from the line and service restored with the portable unit in 20 minutes. Before this, a transformer failure made it necessary to call out a line construction truck usually after working hours, and install a new transformer permanently, requiring at least 2½ hours. The portable unit is expected to justify its cost by elimination of overtime work and by the saving in time in restoring service to the customers affected.

Zoning Ordinance Enforces Deed Restrictions

MIAMI, FLA.—Zoning is proving a positive factor in the active, orderly and substantial development of Miami. Since the enactment of Miami's zoning plan on August 9, 1934, this city has put on renewed growth, with all indications of permanent stability. Naturally the bulk of building activity is in modern homes.

The greatest encouragement and protection is provided for single-family dwellings. In residential zones, original and prevailing deed or subdivision restrictions are considered a part of Miami's ordinance. The enforcement of these restrictions, along with other zoning regulations, is placed squarely with the Chief Building Inspector, through a Zoning Director. On the application for the erection of any structure or for a Certificate of Occupancy for any use, the subdivision requirements are checked first and then zoning regulations and any other pertinent ordinances. It is ofttimes found that deed restrictions are more stringent than zoning regulations. For instance, many of Miami's finer subdivisions call for deeper front yards than ordinarily required under the zoning ordinance. Another specific illustration is in a fine island subdivision where the lots are 60 feet wide, and the minimum side-yard requirement is 10 feet, whereas, if no such deed provision had been made, the ordinance would require only 10 per cent of the average width, which in this case would be 6 feet. This shows the necessity of first checking with deed restrictions.

The cost and type of construction as required under deed restrictions are also of utmost importance. While the cost basis is not ideal for bringing the size and appearance of new buildings up to standards established for any given area, nevertheless, this method having been placed and used by the original subdivider for the protection of all purchasers, it was found to be the most practical method for maintaining established neighborhood character. After all, each subdivision was started as a small planned community. Restrictions that are out of line with present conditions can be changed, as amendments to the zoning ordinance, on petition of a majority of property ownership, but only after a well-advertised public hearing. The method of handling all zoning details, including interpretations, public hearings, etc., through the Zoning Director, helps to check violations at their inception. It does not seem possible to ignore prevailing subdivision restrictions, and Miami's ordinance appears to be working out very well under this plan.

FRANK F. STEARNS,
Miami Zoning Director.

Recent City Manager Appointments

J. C. BAUCUM has replaced L. C. Green as City Manager of Chandler, Okla.

H. L. Griffin has succeeded L. E. Watkins as City Manager of Edmond, Okla.

H. W. Karrow has replaced Anthony J. Netkow as City Manager of Columbia Heights, Minn.

Carleton C. Massey, former Engineer of Fredericksburg, Va., has been appointed City Manager of Salem, Va., to succeed J. J. Cassady.

J. Bailey Morlidge, Civil Engineer and former City Engineer of Bellvue, has succeeded John T. Rawlings as City Manager of Newport, Ky.

H. M. Renner, former Manager of Mangum, Woodward, and Elk City, Okla., has been appointed first City Manager of Cedartown, Ga.

Fred Roark has succeeded Samuel C. Dunlap as City Manager of Gainesville, Ga.

Clyde G. Wilson has replaced E. J. Lacour as City Manager of Gainesville, Texas.

CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.

The Municipal Bond Market

The following are recent sales of new issues, reported in the March issues of *The Bond Buyer:*

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$200,000	Norfolk Co., Mass., District Court-House, Notes	1	1-4 Ser.	.77
8,350,000	Philadelphia, Pa., School District	1.56	1.75 Avg.	1.54
100,000	Chautauqua, N. Y., Refunding Highway	1.60	7	1.57
1,100,000	Rochester, N. Y., Public Works	1.70	6 Avg.	1.67
120,000	Warren Co., N. Y., Bridge and Highway	1.70	1-12 Ser.	1.67
100,000	Rotterdam, N. Y., Public Welfare	1.90	1-10 Ser.	1.84
1,000,000	Jacksonville, Fla., Electric Revenue Certificates	2.25	1-10 Ser.	2.204
230,000	Union Co., N. J., Voting Machine	2.20	1-14 Ser.	2.18
160,000	Trumbull Co., Ohio, Refunding	2.25	5.75 Avg.	2.22
400,000	Waterloo, Ia., Intercepting and Outfall Sewer	2.25	11 Avg.	2.22
100,000	Warren, Ohio, General Improvement, Refunding	2.25	7 Avg.	2.35
341,000	Rensselaer, N. Y., Refunding	2.4	11.16 Avg.	2.36
285,000	Buchanan Co., Mo., Poor Relief	2.5	11.16 Avg.	2.49
163,700	Lackawanna, N. Y., School	2.7	5.5 Avg.	2.56
100,000	Muskegon, Mich., General Refunding	2.75	11 Avg.	2.72
249,000	Bayonne, N. J., Relief	3.75	4.33 Avg.	3.58
340,000	Washington Co., Va., County Sanitary District	4	14.16 Avg.	3.80
300,000	Abilene, Texas., Water Improvement Revenue	4	17 1/3 Avg.	4.14

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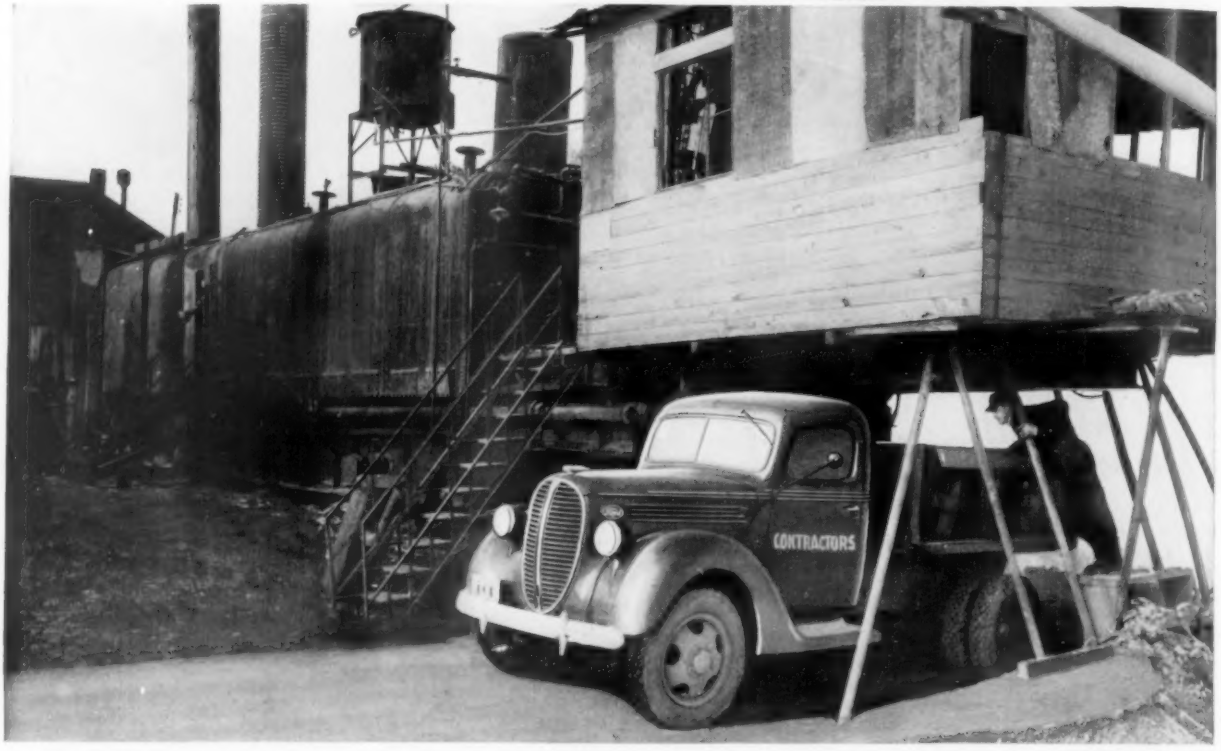

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The Ford V-8 engine is speeding up work for many companies — it continues to roll up new records for performance and economy. The 85-horsepower Ford V-8 Truck engine powers the new 134-inch and 157-inch wheelbase trucks. A choice of either the "85" or "60" V-8 engine is offered in the new 122-inch wheelbase one-ton trucks and the 112-inch wheelbase commercial cars.

The Ford Engine and Parts Exchange Plan is another reason why owners find Ford units profitable and economical to operate. When an overhaul does become necessary, this plan saves time and money — keeps units on the job.

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AND COMMERCIAL CARS

Traffic Control and Facilitation

Conducted by Publications Committee, Institute of Traffic Engineers, 1 Park Ave., New York

Paul L. Green, Chairman; George W. Barton, Kenneth W. Mackall, Miller McClintock, Robert A. Mitchell, William R. McConochie, Arnold H. Vey, Joseph L. Wehmeyer, William A. Van Duzer, Thomas J. Seburn, Roger L. Morrison, Otto K. Jelinek, William C. Brandes

Extra Center Signal Halves Violations

By R. T. DORSEY

Traffic Engineer, Department of Police, Los Angeles, Calif.

COMBINATION of center-suspended and far-corner light signals, to meet the competition of neon and other advertising lights, has brought exceptionally satisfactory results on Los Angeles' Wilshire Boulevard. One installation at Wilshire Boulevard and La Brea Avenue has met tests which indicate advisability of more investments.

Wilshire Boulevard extends from the center of the retail business district westerly toward the center of residential buying power, through to the ocean at Santa Monica. During the past few years there has been an intense commercial development along this artery, particularly near corners where major streets intersect.

Normal traffic flow on Wilshire's 70-foot pavement averages 2,500 cars per hour. In order to meet conditions imposed by this exceptional traffic flow, the city of Los Angeles in 1931 installed a progressively-timed automatic signal system on Wilshire Boulevard, the signals being of the three-light, far-corner type with two-way light exposures. Additions to the system have brought the total number of signalized intersections to 47, with an investment of $125,000.

Initial operation of the Wilshire signal system developed two serious difficulties. One was the tendency of drivers to run through the signals on the amber overlap of the green light. By eliminating the overlapping of these colors, some of this difficulty was overcome. It was further found that the two-way, 90-degree exposure lights failed to provide sufficient warning to drivers, particularly if another vehicle obscured the lights on the right-hand side of the street. Additional lenses overcame this trouble.

Still the percentage of violations was too high. At night, the business section of Wilshire Boulevard is illuminated by an ornamental street-lighting system of 1,000-cp units, plus thousands of business and display advertising signs, many of which use neon gas. Drivers, cautioned or cited for running through signals, declared they were blinded or confused by these other lights and were therefore unable to note the traffic signals. Also, in searching for signal lights, drivers often let their eyes stray from the path of their cars, increasing possibility of accident.

In order to give the driver an additional beacon, a center-suspended four-exposure three-light signal was installed at Wilshire Boulevard and La Brea Avenue, each signal containing twelve 67-watt lights. This signal was operated in sequence with the four-corner signals.

Counts of violations were made *prior* to the installation of the fifth signal, the check being made between 7 A.M. and 7 P. M. of north- and south-bound traffic on La Brea Avenue at Wilshire Boulevard. It was shown that, of 19,412 vehicles observed, there were 779 violations, a percentage of 4.01. Through movements averaged 3.34 per cent; right turns and left turns 2.48 per cent.

After the center-suspended signal was placed in operation, a second check was made. Of the 20,695 vehicles observed, there were 280 violations, a percentage of 1.35. Through movement violations dropped to 0.89 per cent; right turns 3.12 per cent; and left turns to 4.21 per cent. The results for the entire twelve hours checked showed that there were 197 per cent more violations without the center-suspended signal than with it.

The value of the center-suspended signal was even more apparent after dark. Between 6 and 7 P.M., when it was dark, there were 288 per cent more violations without the center signal than with it, showing that the extra signal was even more effective after dark than in day.

In view of these studies, it is planned to equip all principal intersections with the additional signal, to be followed by intermediate installations at such points as may be deemed practical.

Courtesy of Automobile Club of Southern California

Wilshire Avenue traffic at Bonnie Brae Street in Los Angeles. At La Brea Avenue there is a center-suspended beacon operated in sequence with four-corner traffic signals, all made by Eagle Signal Corporation

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Controlled Parking Is Good for Business

By WILLIAM R. McCONOCHIE
Traffic Engineer, Chicago Surface Lines

ECONOMIC justification could be found on many transit streets in Chicago for Ross Schram's proposal in the December, 1937, issue of this magazine, to eliminate curb parking on such thoroughfares during rush hours. This plan, in fact, has been used successfully for many years on boulevard streets carrying buses. Private vehicles have not been excluded from the curb lane by regulation, but the relatively slow speed of buses, and their frequent stops, have accomplished this proposed objective on the heavier routes. Mr. Schram's suggestions have attractive counterparts for car-line streets.

Coach Operation in Chicago

Coaches are operating, at present, on four classes of routes:

1. "Limited ways" with parking and coach stops prohibited.

2. Boulevards with frequent crossings at grade, but with service roadways for access to abutting property.

3. Boulevard streets fronted by either residential or business property, but on which commercial vehicles are prohibited.

4. Business streets, including industrial sections and sections temporarily used for residences but generally zoned for commercial use.

On the Outer Drives, which resemble limited ways in most essential respects, coaches and private vehicles move at comparable speeds. Although the coaches make no stops, they customarily use the curb lane. Their frequency does not justify exclusive use of a lane, and other vehicles are neither retarded nor endangered by sharing a lane with them. Parking, of course, is no problem.

Boulevards with service drives resemble limited ways in that parking on the principal roadway is unknown because it could serve no purpose. Local buses stop at each block, however, and keep to the outside lane for the convenience of the drivers, if for no other reason. With progressive timing of traffic-control signals, speeds can easily exceed the 15 or 16 miles per hour average rate said to be attained by New York subway trains.

Coaches preempt the curb lane on the heaviest section of Michigan Avenue during peak periods when more than 250 coaches per hour are moving at average speeds of 3 to 5 miles per hour. Exclusive shops and tall office buildings line the street, parking is prohibited at all times, and no commercial vehicles are permitted to use Michigan Avenue.

Clear Streets Help Business

Business men should urge the Traffic Revolution. Jackson Boulevard, in the central business district, closely resembles most other downtown streets in width, class of buildings, types of tenants attracted, and front-foot property values. It is different from other streets in that customers do not have to compete for sidewalk space with barrels, boxes, and crates. With all curbs cleared of parking, taxicab stands, and commercial vehicles, business goes on as usual.

Quite differently, in Chicago's "blighted area," surrounding the central business district in a band two or three miles wide, motorists and truck drivers are kings. The Madison Street car line carries 17.2 people across the outer border of this area for every *one* using private passenger automobiles on this street during the evening rush hour. Although the street averages only 48 feet in width through this area, four lanes of parked automobiles and trucks commonly confine all traffic to the car tracks. *This neighborhood cannot attract enough business to pay for its share of police and fire protection and other municipal functions.*

Parking should be eliminated, obviously, along residential streets at such times and places as are necessary to give rapid public transportation to the people living in the adjacent areas. The advantages of prohibiting *rush-hour* parking along business streets are not so generally understood.

Merchants and business men are usually benefited even more than common-carrier riders by such regulation, for:

1. Employees arriving by automobile park on side streets, leaving curb space in front of stores available for a number of customers during the active period of the business day.

2. Cost of doing business is cut, since merchandise is handled more cheaply when traffic moves freely, and curb space can be found for loading and unloading.

3. Show windows are more effective when they are no longer cut off from view by one or two lanes of parked vehicles.

4. A small percentage increase in customers arriving by public carrier frequently exceeds the total number using individual transportation. In Chicago, before elimination of curb parking in the central business district, a survey of type of conveyance used by patrons of various business houses disclosed that:

90.9 per cent arrived on public-carrier vehicles.

6.6 per cent arrived in private automobiles which did not park at the curb.

CENTRAL AVENUE, CHICAGO, WITH PARKING, AND WITH NO-PARKING, AT COACH STOPS

1.6 per cent arrived in private automobiles which were curb parked.

1.1 per cent arrived in taxicabs.

Elimination of curb parking caused a marked increase in number of private automobiles entering the central business district.

Advantages

If this appears to be collusion between business men and coach riders to discriminate against motorists, consider that:

1. The motorist will usually save more than enough time in traveling on streets cleared of *rush-hour* parking to offset the occasionally longer walk from parking space to ultimate destination.

2. The prevention of all-day parking in choice locations by space hogs will benefit many motorists at slight inconvenience to a few.

Mr. Coach Rider has found a champion indeed in Mr. Schram. So also have Mr. Businessman and Mr. Motorist. Who, in *your* city, has the vision and courage to give momentum to a program of *rush-hour* parking prohibition on transit routes? Too little is being done to reap the benefits of intelligent control of parking.

Successive Steps In Road Improvement All Call For Calcium Chloride

No matter how limited your street or road budget may be you will find that Calcium Chloride will give you better roads for the money.

Dust Control Comes First

Road improvement starts by applying Calcium Chloride to the surfaces to prevent dust. Prevention of dust also prevents crumbling of surfaces and consequent blowing away of costly material. Even though your budget is extremely limited, you may use the spot treatment method by applying Calcium Chloride in front of homes and on curves and turns where wear is greatest and dust is most dangerous. Nothing will give you more satisfaction nor greater approval from residents than dust control.

Years of testing other dustproofing materials only serves to intensify the value of clean, odorless Calcium Chloride Flake. The flakes possess the property of absorbing several times their weight in moisture from the air. The moisture film in the fine materials holds coarser materials together and keeps them dustless, thus saving your roads and streets. So although your road improvement may be only "skin deep" it is a definite step toward the firm, smooth, dustless roads every community needs and wants. For more satisfactory improvement and easier maintenance the entire road may be dustproofed at a cost of from $150 to $300 a mile. Even though your budget is small, you will find Calcium Chloride necessary for best results. No other material will give you as much improvement for so little money. If you can go no further, be sure to try moisture binding dust control with Calcium Chloride this year.

Surface Consolidation

Given a little more than a mere maintenance budget, a marked improvement to natural soil roads may be secured by adding moderate amounts of either aggregates (gravel, stone, slag, etc.) or binder soils (clay, ground limestone, shell, etc.) or both if occasion demands. Bind such materials in a moisture-film bond by mixing in Calcium Chloride and you get results that are very satisfying. This method, called by some, surface consolidation or partial stabilization, may even be secured with little or no addition of materials if the soil composition of your road is right. In any event, whether the depth of this consolidation is a half inch or two inches, it is a step in the right direction. It is progressive improvement on the pay-as-you-go plan at a cost you can afford to pay because you govern the depth of this stable dustless wearing course by the money you have for road improvement. Some of the country's best roads have been built up this way by adding natural soils and Calcium Chloride year after year until a thick stabilized mat is secured.

Calcium Chloride stops dust. Binds surfaces with moisture.

Complete Stabilization

Where budgets permit, it is possible to build a good road in one operation by adding the fully stabilized dustless compacted mat either on old highways or new locations. The aggregates, binder soils and Calcium Chloride may be road mixed right on the highway or prepared in special plants for mixing prestabilized materials. The work may be done by qualified contractors as it is done in many states or it may be done by local officials. Mixing plants are available in some localities where gravel pit or other aggregates producers will supply materials ready for placing on highway or street. Such roads, when compacted, are ideal bases for pavements.

Surface consolidation calls for added aggregate or binder with Calcium Chloride.

Complete stabilization with local soils and Calcium Chloride makes ideal secondary roads.

The Moisture Bond Is The Secret Of Success

The moisture film cohesion of binder soils, kept moist with Calcium Chloride, is the secret of success in this modern method of road improvement. Stable, moisture bound soil mixtures are much better for pavement foundations, in fact, some state specifications demand them. The United States Bureau of Public Roads uses such soil mixtures and permits their use in government projects.

Booklets Describing Methods Sent Promptly On Request

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Improving Municipal Administration

Current Items from the Public Administration Clearing House

Muskegon "Charts" Course of Municipal Government

UP-TO-DATE operation of Muskegon's municipal government can be "seen at a glance" by any city commissioner or citizen who stops at the City Hall on the first of the month. On that day, reports the International City Managers' Association, colored bar charts showing trends in every municipal activity are posted in the city manager's and departmental offices. This is the kind of information available:

An expenditure chart shows the total amount spent by each division of the municipal government and the extent to which funds are overspent or underspent in comparison with budget allotments. A receipts chart indicates the amount received from each type of revenue in each month, and the total amount, as compared with the budget estimates.

A line graph shows the number of arrests made by each patrolman, and the number made in each quarter of the year. The Fire Department chart shows for every year since 1912 the fire loss and number of alarms. The line graph for the Building Department indicates for each year since 1920 the number of permits, fees collected, and value of buildings constructed. The Water Department chart compares collections by month with billings. WPA charts give the number of men on the job each day of the month, and the percentages of Federal and local contributions used.

Small Cities Join Movement to Plan Their Futures

SMALL cities may come to the fore in city planning during 1938, if activity of recent months continues, the American Society of Planning Officials announces. The need for aid in grappling with problems of traffic, low-cost housing developments and airport placement is bringing forth new local planning agencies and the re-establishment of agencies cut down by depression economy.

A.S.P.O. cites the following planning activity for cities in the 50,000 and under population group:

Establishment of new agencies in such widely scattered communities as Santa Cruz, Calif.; Yakima, Wash.; Sioux City, S. Dak.; Waukesha, Wis.; and North Providence, Mass. Appointment of a new planning commission by Austin, Texas, and approval of a capital budget for long-term planning for Montclair, N. J.

Formation of a council of planning boards by several municipalities of Essex County, N. J., which together will consider location of a state highway, deficiencies in present zoning and planning legislation, and means of assisting in the formation of planning boards in neighboring communities.

Enabling legislation passed by the current Kentucky legislative session to permit cities of the third, fourth, fifth and sixth classes to create planning commissions.

To prepare cities in this population bracket for their attack on planning problems, Public Administration Service, governmental consultants, has announced publication of a new edition of "Planning for the Small American City." The monograph, written by Russell Van Nest Black, Director of Planning, New Jersey State Planning Board, and consultant, National Resources Committee, lays out all the steps in plan making, from formation of the planning agency to gathering preparatory information. Advantages modern planning offers the small city are analyzed in relation to street plan and street design; parks, playgrounds and other recreational areas; zoning; location of public buildings, airports and other aviation facilities; railroads and street-railway placement; housing; and city beautification.

Emphasized is the necessity for a permanent organization and a long-term financial program for carrying out the city plan. "No city plan is ever finished," counsels Mr. Black.

States and Cities Act to Compel Car Inspection

IN an effort to make all automobiles safe for driving in traffic, more and more states and cities are installing compulsory motor-vehicle inspection, reports the International Association of Chiefs of Police. Washington, D. C., most recently added to the list, will demand an inspector's okay beginning with 1939 automobile registration.

The nation's capital follows 15 states and more than a dozen cities with compulsory inspection laws. The states include Arkansas, Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, Nebraska, New Hampshire, New Jersey, New Mexico, Pennsylvania, Utah, Vermont and Virginia, with Washington's law soon to go into effect. Six other states have laws for specific classes of municipalities only; New York's law applies to special types of commercial vehicles.

Among the cities that have installed testing stations, either because their states provided no inspection or because they wished more stringent regulation, are Memphis, Tenn. (a successful pioneer in 1934); Billings, Mont.; Chicago, Ill.; Cincinnati, Ohio; Des Moines, Iowa; Evanston, Ill.; Knoxville, Tenn.; Miami, Fla.; Omaha, Nebr.; Portland, Ore., and Seattle, Wash.

Vehicle inspection campaigns are more than ten years old, but for a period they were purely educational. Even now, standards for determining the proper condition of various equipment are incomplete. However, a project is under way, sponsored by the National Conservation Bureau and the American Association of Motor Vehicle Administrators, to establish standards of inspection.

Most of the laws and ordinances specify testing of brakes, headlights, wheel alignment, steering gear, windshield wipers, tail-lights, rear view mirror, horn, windshield, muffler, and tires. Costs of inspection vary from nothing—in Delaware, Maryland, New Mexico and Virginia—to 50 cents. The number of inspections each year varies from one in Vermont to three in New Mexico.

WPA Workers' Aid in Housing Surveys to Speed City Programs

WITH approval of housing surveys as WPA projects, cities gained a valuable aid in their preparation for slum clearance and low-rent housing programs, the National Association of Housing Officials points out. The order approving the surveys, which require house-to-house canvassing, was passed in Washington this month with the announcement that the first trial project would be Detroit.

Housing surveys are useful to local authorities at various stages in their programs, according to the Housing Officials. They may be employed (1) for general planning and education; (2) for joint use with other public, semi-public and private housing agencies; (3) for direct assistance in selecting a site for housing; (4) for guiding project design by determining family and living characteristics of prospective tenants.

Five conditions must be met in order to secure WPA aid with exemption to the "no-canvass" rule applying to most WPA projects. To qualify, a housing survey must be of undoubted public usefulness; must be very specific in form; must be competently supervised; must be supported by local public opinion; and should be endorsed by other official agencies which might make use of the results, such as the public works, building, health and fire departments and the local planning agency.

Cities are advised that their survey projects will move faster if they follow fairly closely the standard technical procedures devised by WPA. These procedures are contained in manuals of instruction on previous WPA projects. A supplementary manual particularly for housing area surveys is being prepared with the aid of the United States Housing Authority and the National Association of Housing Officials.

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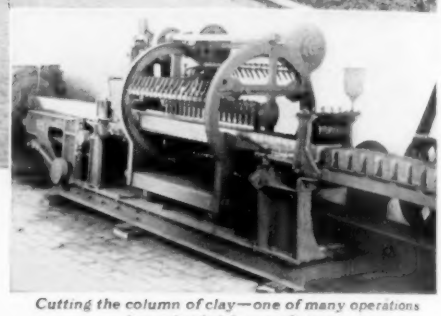

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ADDED SAFETY FEATURES: A brick pavement is amply visible at night and restful and non-glaring by day. According to Highway Research Abstracts, in experimenting with artifical colors for other pavement types brick red has been found "most satisfactory and attractive." Traffic lanes and other safety markings are made permanent in the pavement by use of contrasting colors of brick.

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FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

Zoning and Planning Notes

With the cooperation of
EDWARD M. BASSETT
Author of "Zoning: The Laws, Administration and Court Decisions During the First Twenty Years"

Trailer Camps

FLORIDA.—*Egan v. City of Miami*, 178 So. 132 (Supreme Court, January 5, 1938).—The general statute empowering the State Board of Health and the Hotel Commission to impose health and sanitary regulations on tourist camps does not deprive municipalities of power to supplement the regulations so imposed within their jurisdiction, and hence an ordinance of the city of Miami regulating tourist camps, tent cities and trailer camps was not invalid on the ground that such power was vested exclusively in the Hotel Commission and the State Board of Health. These supplementary regulations, having to do with the construction of cottages, their distance apart, drainage, toilets, baths, lighting, ventilation and other requirements essential to health and sanitary living conditions of the inhabitants of the municipality, were not invalid as being arbitrary or unreasonable.

Zoning Ordinance—Report of Planning Board

MASSACHUSETTS.—*Whittemore v. Town Clerk of Falmouth*, 12 N. E. 2d, 187 (Supreme Court, December 28, 1937).—The statutory requirement that no by-law changing the boundaries of zoning districts shall be adopted until after a public hearing and submission of a final report with recommendations by the planning board is peremptory, and without such a report a town meeting has no jurisdiction to consider the merits of such a change. A report submitted by a planning board that it was "unable at this time to make any recommendation" because of a tie vote was not a fulfillment of these requirements.

Private Covenant—Non-Conforming Use

NEW YORK.—*People on Complaint of Wolff, Building Commissioner of City of Long Beach, v. Margolies*, N. Y. Supp. 2d, 969 (Nassau County Court, December 20, 1937).—Under the zoning ordinance of the city of Long Beach, in the district in which the defendant Margolies was situated, only one-family detached buildings for one housekeeping unit are allowed. Defendant's apartment house, with separate housekeeping units, was so used before the zoning ordinance was passed, but the city claims that this use was illegal because it violated private restrictive covenants in the deed by which the property was acquired.

The Court holds that the use was not illegal because in this case the restrictions could be enforced only by the grantor, and he had not done so. The restrictions were not imposed in accordance with any uniform plan, and gave no other party any right of enforcement. The deed under which defendant held stated that the grantor was not obliged to restrict any other property, provided for the termination of the restrictions on a given date, and reserved to the grantor the right to alter or amend them. The grantor had annulled the restrictions by informal unrecorded memorandum, which estopped him from enforcing them. The use was therefore not only existing but lawful before the passage of the zoning ordinance, and could legally continue as a non-conforming use.

Curb Cuts

NEW YORK.—*Socony Vacuum Oil Co., Inc., v. Mordock*, 1 N. Y. Supp. 2d, 574 (Supreme Court, December 10, 1937).—This is a proceeding to review the action of the Board of Standards and Appeals of the City of New York in affirming the Building Commissioner's application for a curb cut to allow access to the oil company's proposed gasoline service station.

On or about June 2, 1936, the petitioner applied to the Commissioner of Buildings of the City of New York for a permit to erect at 102 East 13th Street and 127 Fourth Avenue a salesroom, repair shop and gasoline service station, together with the necessary tanks and pumps, all of which would be situated wholly within the building line, and simultaneously informed the Commissioner that permits for curb cuts, boxes and all necessary work beyond the building line would be obtained before such work was started. On the same day the Commissioner denied the application on the ground that the erection of the station on these premises would be hazardous to pedestrians.

Thereafter, on or about June 16, 1936, the petitioners appealed to the Board of Standards and Appeals, which reversed the decision of the Commissioner on the ground that, since the premises were located in an industrial district, the Building Zone Resolution permitted the maintenance of a gasoline station there. The Board said further that the Commissioner of Buildings had the power to deny a permit for curb cuts, if in his opinion such cuts would be dangerous to pedestrians, and that the determination of the Board should not be construed to prejudice the action of the Commissioner of Buildings on any application which might thereafter be made to him for a curb cut.

Accordingly, on October 2, 1936, the petitioner filed with the Commissioner of Buildings an application for permission to lower the curb of the sidewalk on its East 13th and on the Fourth Avenue front, in order that cars could cross the sidewalk to enter and leave the proposed gasoline service station. This application was denied; and on a second appeal to the Board, on the ground that the decision of the Commissioner was arbitrary, unreasonable and illegal, the Board affirmed the determination of the Commissioner. By its decision the Board held that the power to lower the curb, heretofore held by the Borough President, had been transferred to the Commissioner of Buildings in its entirety and that therefore he had the discretionary power to lower the curb to provide a carriageway across a sidewalk when in his opinion the actual or intended use of such carriageway would endanger pedestrians. The Board did not stop with its affirmance of the decision of the Building Commissioner. It went further. Under the New York City Charter, the Board, in such cases, may make such determinations as in its opinion ought to be made in the premises, and to that end has all the powers of the officers from whom the appeal was taken; and in thus considering the matter as if originally presented to it, the Board decided that to grant the petitioner's application for curb cuts would be extremely hazardous and against public welfare and safety.

The petitioners therefore obtained an order of certiorari to review the action of the Board, and to that end asked leave to take additional testimony. The Board moved to dismiss the order of certiorari; the motion was denied, and the taking of additional testimony allowed. The issues having been joined, the case now comes before this Court, which decides in favor of the Board.

The power formerly exercised by the Borough President in his discretion to grant curb cuts has now by statute been transferred in toto to the Borough President, and in the opinion of the Court it cannot be said that, in view of the congestion at the point in question, he acted arbitrarily. Nor does the denial of the permit interfere with the substantial property right of ingress and egress.

It is true that the Board of Standards and Appeals is not bound to follow the ordinary rules of evidence applicable to actions in the courts. Its action, however, in receiving a Police Department report after the investigation and hearing had concluded, and not giving the petitioners an opportunity to analyze and meet it with additional testimony, was unwise. It was this action on the part of the Board that undoubtedly led to the ruling that the petitioners should be afforded an opportunity to supply the additional testimony which it found to be necessitated by the police report. If the Board relies upon its own investigations, it should in-

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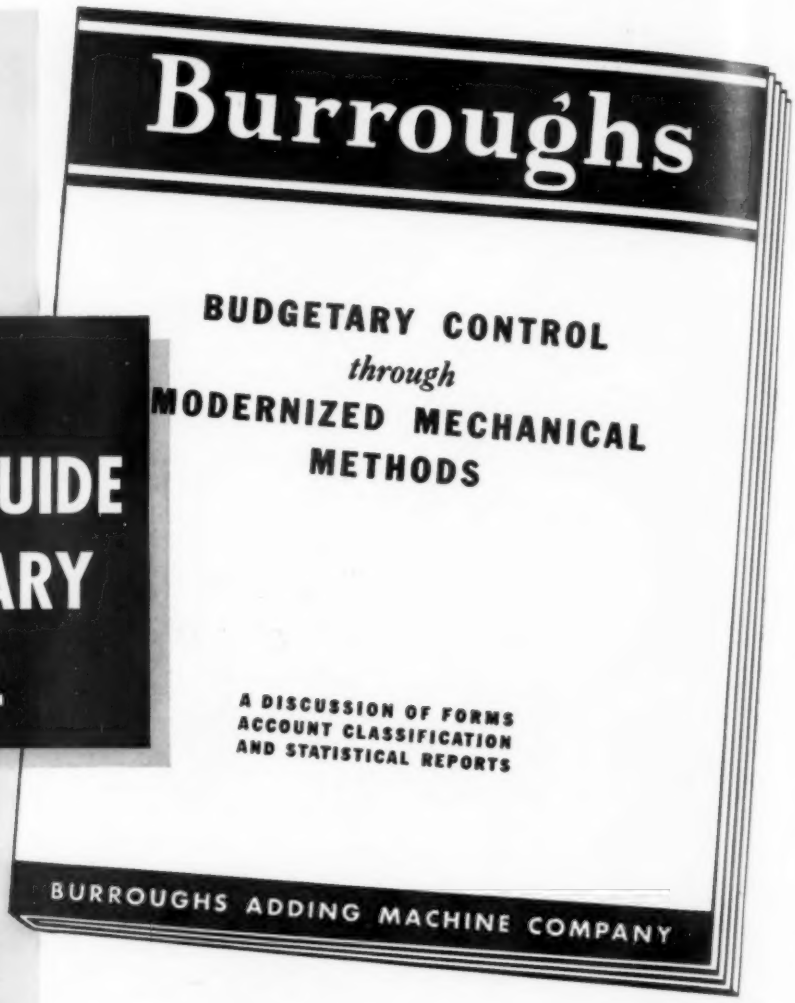

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corporate a summary of its findings in the record before the hearings are closed. Under the law great power has been placed in quasi-judicial bodies like the Board of Standards and Appeals. Their findings of fact are in the most part conclusive and not to be interfered with by the courts. It is all the more important, therefore, that parties in interest have their full day in court before these tribunals and be given a complete opportunity to meet all the issues there presented.

The fact that permits had been granted in other instances does not show that the Board was arbitrary in this case.

EDITOR'S NOTE.—For other cases on curb cuts, see the New York case of *Cameron v. Murdock*, with editor's note, in our September, 1936, Notes.

Eminent Domain

NEW YORK.—*Village of Cornwall v. County of Orange*, 277 N. Y. 35 (Court of Appeals, January 25, 1938).—This is an action by the village to enjoin the county from acquiring by condemnation certain lands necessary as a right-of-way to enable the State Superintendent of Public Works to build a state highway as directed by law, on the ground that the construction of this highway would cause irreparable damage to the village water supply. The complaint alleged that the construction of the highway through the watershed would cause a more swift runoff of rainwater into the village reservoirs, which are too small for either the present or the future needs; that the blasting necessary to the construction of the highway would bring people and automobiles into the watershed and thereby pollute the water supply; and that its construction would prevent the extension of the landholdings of the village for water-supply purposes—all to the irreparable damage of the village.

The Court below held that the action to enjoin would not lie because the land sought to be condemned was to be put to a public use, and no existing legal right of the village was infringed by the taking; and that if any such right were affected, the remedy would be mandamus to compel compensation.

Zoning Ordinance—Non-Conforming Use

OKLAHOMA.—*Royal Baking Co. v. Oklahoma City*, 75 Pac. 2d. 1105 (Supreme Court, February 1, 1938).—This is an action by the city against the Baking Company to enjoin it from using a small frame building on its property as a garage and repair shop.

Prior to 1923, the Baking Company had been operating a commercial bakery on its lots known as Nos. 15 and 16, and had purchased adjoining lots Nos. 13 and 14 for future business purposes. On lots Nos. 13 and 14 was located a small frame building, used as a residence for employees. In 1923 the city passed a zoning ordinance, putting the Baking Company's property into a residence district. Thereafter the Baking Company began to use the building on lots 13 and 14 as a garage and repair shop. This the city seeks to stop, on the ground that it is contrary to the zoning ordinance; and the company defends on the ground that the structure was a part of its non-conforming business.

This claim the Court sustains, and refuses to interfere with the use of the structure as a garage and repair shop. The property was needed for the expansion of the company business and was originally bought with such expansion in view. The locality is not suited to residence, and its use as a garage and repair shop will not be a damage to the neighborhood.

In its opinion the Court quotes with approval *Appeal of Haller Baking Co.*, 295 Penn. 257, which holds that "the use for which the property is adapted need not be in actual operation at the time of the adoption of the ordinance, if the attending circumstances connected with the property bear out the conclusion that the owner intended to use the property for that purpose."

The Court also observes that:

"While many cases can be found which uphold the right to restrict non-conforming uses, such cases, so far as we have been able to determine, have had under consideration situations where there has not been a breaking-down of the district. In this case, as found by the Court, the district is on the retrograde, so far as the classification is concerned [i.e., as a residence district]. Whether rightly or wrongly, business houses have come into existence. The character of the neighborhood evidently has so changed that probably no number of injunctive processes could stop the trend or obtain the high classification anticipated. At all events, we cannot say, in view of the circumstances, that it is necessary for the public welfare, safety or health of the neighborhood that the strict letter of the law be enforced when to do so will present a serious constitutional question. Laws should not be given a construction which will imperil their validity when reasonably open to a construction free from that peril."

Zoning Public Property

An Important Decision Affecting Water Towers

NEW YORK.—*Wallerstein v. Westchester Joint Water Works*, 1 N. Y. Supp., 2d. 111 (Supreme Court, Special Term, Westchester County, December 10, 1937).—The plaintiffs, Wallerstein and others, are property owners and residents of that section of the town of Harrison known as "Purchase," a fine residence community. The defendant water works is a corporation formed, pursuant to the statute, by the towns of Harrison and Mamaroneck and the village of Mamaroneck for the purpose of obtaining and supplying water for both fire protection and domestic consumption. The water supply of the district is inadequate, and an auxiliary water-supply system is necessary. To meet this need, a plan was adopted by the governing bodies of the three municipalities above named, a part of which called for the erection of a steel water tower 90 feet in height and about 42 feet in diameter in the immediate vicinity of plaintiff's property, which lies within the "residence A-2" district on the zoning map of Harrison. This residence district, which also includes the property upon which the tower has been partly erected, is the most highly restricted area in the town of Harrison, under its zoning ordinance.

The plaintiffs contend that the erection of the tower violates the zoning ordinance, and ask for an injunction against it. The operation of a water tower is not one of the enumerated uses available in this district under the zoning ordinance. In the consideration of the effect to be given the zoning ordinance restrictions, it becomes necessary to pass upon the question of whether the collection and distribution of water by a cooperative corporate entity composed of several municipal corporations is the exercise of a governmental function or the discharge of a corporate service. If the defendant water works is acting in a private or proprietary capacity, it is subject to the provisions of the ordinance.

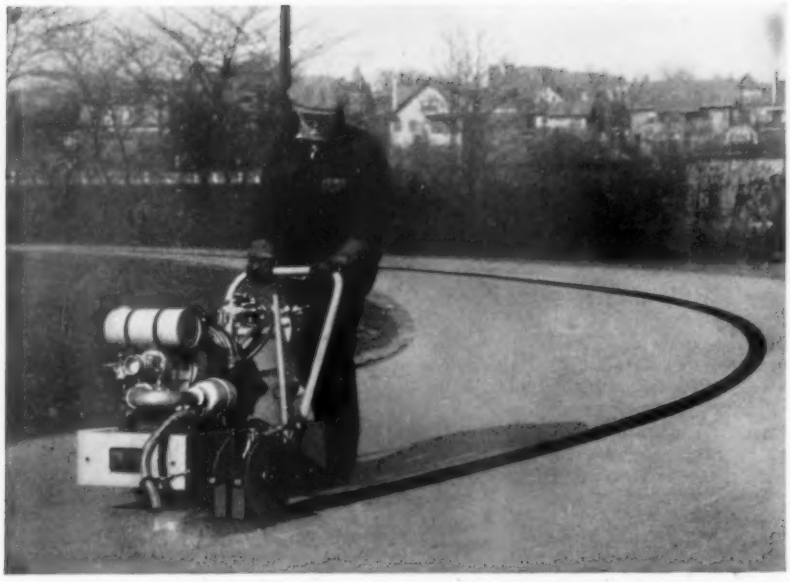
After citing cases bearing upon the matter, the Court says that, while the question is not free from doubt, it prefers the reasoning which supports the conclusion that the defendant, supplying water both for public fire protection and for private needs, is engaged in the discharge of a governmental function.

The defendant also contends that the zoning ordinance is invalid as against it, because failing to make any provision for the construction and maintenance of a water-supply system. The argument is based upon the statutory requirement that the zoning regulations serve the purpose of promoting the health, safety, morals, and general welfare of the community, and shall also facilitate the adequate provision, among other things, of water.

The zoning ordinance of the town of Harrison specifies no district in which a water tower may be erected or reservoirs may be placed. It cannot be said that a zoning plan which would effectively prohibit the construction of any water-supply system and its adjuncts meets the requirements of the statute. While such an ordinance may be deemed valid as to those matters which it properly regulates pursuant to the statute, it cannot be permitted to prevent citizens of a community from obtaining an adequate supply of water.

It should also be pointed out that, in the absence of bad faith or waste of public funds, it is not ordinarily the function of the judiciary to review the determination of the governing bodies of municipalities, invested with a wide discretion, with respect to the type of public improvement to be made, or the place where it shall be located. Nor will the completed structure constitute any such disfigurement of the terrain as the plaintiffs claim, and generally the damage, if any is suffered by the plaintiffs, will be negligible. No injunction, therefore, is proper.

EDITOR'S NOTE.—For other cases on this subject, see the Michigan case of *Taber v. City of Benton Harbor*, with editor's note, in our Notes for January, 1938.



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The City's Legal Rights and Duties

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Petition in suit for injury to pedestrian who stepped from automobile into hole in sidewalk near curb held to state right to recover damages (Georgia Court of Appeals: *City of Rome v. Hanson*, 194 S. E. 887).

City held not liable for injury caused by WPA worker in negligently operating municipal truck, he not being under municipal control (North Carolina Supreme Court: *Shapiro v. City of Winston-Salem*, 194 S. E. 479).

City held not liable for injury to CWA worker due to collapse of bridge on which he was working (Washington Supreme Court: *Brooks v. City of Seattle*, 74 Pac. 2d, 1008).

City held to have taken reasonable precautions to prevent sidewalks from becoming icy (Connecticut Supreme Court of Errors: *Johnson v. City of New Haven*, 196 Atl. 343).

City held liable for injury to pedestrian who fell through coal hole owing to defective covering (Pennsylvania Supreme Court: *Maric v. City of Pittsburgh*, 194 Atl. 902).

City held not immune from liability for injury to motorist due to collision with unlighted traffic signal amounting to nuisance (New York Supreme Court, Appellate Division: *Murphy v. Village of Farmingdale*, 299 N. Y. Supp. 586).

Fire chief's death at fire through excitement and heart failure held not compensable as accidental injury within meaning of Workmen's Compensation Act (North Carolina Supreme Court: *Neely v. City of Statesville*, 193 S. E. 664).

Annexation

Doubt as to the propriety of annexing certain territory to city held properly resolved in support of an ordinance providing for annexation, even though there was an unannexed tract lying between the original city and the annexed area (Springfield, Mo., Court of Appeal: *Seifert v. City of Poplar Bluff*, 112 S. W. 2d, 93).

Attorneys

City held not liable for services of attorneys employed to defend its officials against charges of maladministration (Texas Court of Civil Appeals: *City of Del Rio v. Lowe*, 111 S. W. 2d, 1208).

Business Regulations

Ordinance closing stores on Sunday, but exempting drugstores, held invalid as unjustly discriminating against grocers; because drugstores handled certain goods sold in groceries (Colorado Supreme Court: *Allen v. City of Colorado Springs*, 75 Pac. 2d, 141).

Contracts

Water district and indorsers held not liable on note given for machinery, issued without required approval by taxpayers, but seller held entitled to possession of machinery and reasonable rental for its use (United States Circuit Court of Appeals, Fifth Circuit: *Cameron County v. De La Vergne E. Co.*, 93 Fed. 2d, 373).

Depositaries

City held not preferred creditor of insolvent national bank as to municipal funds deposited, although required statutory depositary bond was not given and although the bank unauthorizedly purported to pledge securities in lieu of such bond (United States Circuit Court of Appeals, Fifth Circuit: *City of Ft. Worth v. McCamey*, 93 Fed. 2d, 964). Town held not preferred creditor against insolvent state bank in which deposits were made after expiration of period for which bank was designated depositary (St. Louis, Mo., Court of Appeals: *Town v. Canton v. Moberly*, 111 S. W. 2d, 969).

Elections

Under statute requiring election of municipal officer by ballot at a town meeting, election under single ballot cast pursuant to vive voce vote held invalid (Vermont Supreme Court: *Smith & Son v. MacAulay*, 196 Atl. 281).

Interest

Statute providing for interest on judgments held to include judgments against municipalities (Alabama Supreme Court: *Jefferson County v. City of Birmingham*, 178 So. 226).

Licenses

Ordinance licensing barbers held void as conflicting with state licensing law (Kansas Supreme Court: *Trimble v. City of Topeka*, 75 Pac. 2d, 241).

Ordinance imposing license fees, bond requirements, etc., upon plumbers upheld (Pennsylvania Supreme Court: *Rock v. City of Philadelphia*, 196 Atl. 59).

Ordinance limiting to residents of the municipality the granting of licenses to operate junkyards held void (New Jersey Court of Errors and Appeals: *Lipkin v. Duffy*, 196 Atl. 434).

Statute authorizing state commission to regulate motor-vehicle transportation on streets and highways held not to have abrogated municipal authority to license common carrier vehicles (Tennessee Supreme Court: *City of Chattanooga v. Jackson*, 111 S. W. 2d, 1026).

Ordinance requiring advertising distributors to secure a license held inapplicable to one distributing circulars urging workers to join union, unless it be shown that he was engaged in the distributing business (Rochester, N. Y., City Court: *City of Rochester v. Parr*, 1 N. Y. Supp. 2d, 771).

Ordinances licensing and regulating lenders of money without security upheld (Texas Court of Civil Appeals: *Berry v. City of Ft. Worth*, 110 S. W. 2d, 95).

Terminal service rendered by railroad held so related to interstate commerce as to preclude levy of privilege tax by city (Tennessee Court of Appeals, Western Section: *Illinois Central R. Co. v. City of Memphis*, 110 S. W. 2d, 352).

Municipal Incorporation

Incorporation of village containing lake and territory largely composed of summer cottages upheld as proper means of remedying inadequate police protection, etc. (Wisconsin Supreme Court: *In re Incorporation of Village of Twin Lakes*, 277 N. W. 373).

Municipal Territory

Municipal jurisdiction for taxation purposes over detached lands not legally subject to inclusion within municipal limits held not sustainable through landowners' acquiescence in town's attempted assumption of jurisdiction (United States Supreme Court: *Ocean Beach Heights, Inc., v. Brown-Crummer Investment Co.*, 58 Sup. Ct. 385).

Municipal Utilities

Proceedings by city to acquire light and power plant, opposed by utility company and contractors' association, upheld (Utah Supreme Court: *Utah Power & Light Co. v. Provo City*, 74 Pac. 2d, 1191).

Ordinances

Municipality held not entitled to question regularity of adoption of ordinance included in compilation of ordinances officially authorized, and council record that ordinance was adopted held to imply readings essential to valid adoption (Nebraska Supreme Court: *Village of Deshler v. Southern Nebraska Power Co.*, 277 N. W. 77).

Police Measures

Ordinance restricting bathing in waters within or bounding borough held invalid as unreasonably confiscating rights of operator of commercial bathing beach (New Jersey Supreme Court: *Watchung Lake, Inc. v. Mobus*, 196 Atl. 223).

Public Utilities

Village held barred to question validity of ordinance granting electric franchise where grantee was permitted to operate for twenty years without objection (Nebraska Supreme Court: *Village of Deshler v. Southern Nebraska Power Co.*, 277 N. W. 77).

Gas company held amenable to reasonable regulation by city as to quality of gas to be furnished, but ordinance prohibiting addition of air elements to fuel gas held unreasonable (United States Court of Appeals, Fifth Circuit: *Lone Star Gas Co. v. City of Fort Worth*, 93 Fed. 2d, 584).

Factors properly considered in determining the reasonableness and validity of gas rates determined (Ohio Supreme Court: *East Ohio Gas Co. v. Public Utilities Commission*, 12 N. E. 2d, 765).

Charter held to have authorized city to permit electric companies to place poles, etc., in streets, constituting an irrevocable franchise (Tennessee Supreme Court: *City of Chattanooga v. Tennessee Electric Power Co.*, 112 S. W. 2d, 385).

City held entitled to levy privilege tax upon water company despite its previous grant of franchise to the company to use streets (West Virginia Supreme Court of Appeals: *City of Huntington v. Huntington Water Corp.*, 194 S. E. 617).

Riots

Under statute making city liable for injury to property by rioters, insurance company held entitled to hold city liable under assignment of street-railway company's claim against city for such injury (Wisconsin Supreme Court: *Northern Assurance Co. v. City of Milwaukee*, 277 N. W. 149).

Sewage Disposal

City held liable to landowners for noxious odors affecting enjoyment of their property, caused by municipal sewage-disposal plant (Arizona Supreme Court: *City of Phoenix v. Johnson*, 75 Pac. 2d, 30).

Sinking Funds

Statute authorizing city to consolidate sinking-funds established for separate bond issues held void as violating rights of bondholders (Pennsylvania Supreme Court: *Clark v. City of Philadelphia*, 196 Atl. 384).

Special Assessments

City held liable for loss resulting from clerk's embezzlement of special assessment funds collected for benefit of bondholders (Idaho Supreme Court: *Cruzen v. Boise City*, 74 Pac. 2d, 1037).

Streets

City held entitled to condemn triangular tract of land formed by highway junction to eliminate traffic dangers (Texas Court of Civil Appeals: *Massie v. City of Floydada*, 112 S. W. 2d, 243).

Taxation

Municipal bridge commissioner's salary held not subject to Federal income taxation though payable out of bridge tolls (United States District Court, Western District of Kentucky: *Boomer v. Glenn*, 21 Fed. Supp. 766).

City held preferred creditor of bankrupt as to municipal sales taxes due from him (United States Circuit Court of Appeals, Second Circuit: *City of New York v. Lattin*, 93 Fed. 2d, 471).

Municipal tax levied on commercial delivery trucks operated in city held not invalid as imposing discriminatory occupation tax against non-residents, but inapplicable to non-resident making deliveries on orders previously taken and paying taxes to state and city where truck was owned (Springfield, Mo., Court of Appeals: *City of West Plains v. Noland*, 112 S. W. 2d, 79).

City held not liable for wrongs against individuals committed by officials in attempting to collect taxes (Texas Commission of Appeals: *Black v. Baker*, 111 S. W. 2d, 706).

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Urban Blight and Slums

Urban Blight and Slums: Economic and Legal Factors in Their Origin, Reclamation and Prevention.—By Mabel L. Walker, with special chapters by Henry Wright, Ira S. Robbins, W. Phillip Shatts, Kenneth H. Zabriskie, A. C. Shire and Richard U. Ratcliff. Sponsored by Harold S. Buttenheim and Lawson Purdy. Harvard University Press, Cambridge, Mass. 1938. *xvi* + 442 *pp.* $4.00 *from* THE AMERICAN CITY.

This is the twelfth and most voluminous of the "Harvard City Planning Studies." Contrary to the contention of a great many people, it is maintained in this study that blight need not necessarily be caused by poverty nor do the poor need to live in blighted areas. Numerous factors may contribute to blight and deterioration of an area of a city, and likewise there are many fronts on which the great problem of prevention and eradication may effectively be attacked. As one peruses this careful inquiry into the causes and cures of blight, the pattern for improvement gradually takes form. In the chapter entitled "Summary and Conclusions," thirteen objectives are listed: an adequate city plan; more logical zoning regulations; more effective control of subdivisions; better and more standardized building regulations; clear and sufficient legal powers for the creation of state and local housing authorities; more effective methods of land assembly at fair prices, and of the exercise of eminent domain for housing purposes; reform in the system of taxation; wider use of excess condemnation for replanning purposes; improvement of home-financing policies; the creation and rationalization of a real home-building industry; extensive government research in the various aspects of the problem; government demonstration projects and an intelligent and informed public opinion.

In answering the need for good housing for the masses of our population by the quickest possible routes, there has been sanction of government subsidy. But a careful study of present housing costs in relation to the buying power of the low-income groups demonstrates the impossibility of loading the heavy cost of a complete job on the government under our capitalistic system. The subsidies that are now being provided by the Federal Government are necessarily so high as to choke their own increase, and unless we work on the many above-named methods of stabilizing the housing industry and reducing its cost, the public funds available will not be spread over many actual dwelling units. The use of government money is important in fighting blight, but it must not and can not be used recklessly to hide the many fundamental mistakes and inefficiencies of the present home-building industry. Property owners must cooperate to reclaim their own and surrounding properties from a blighted state, private enterprise must fight to lower the costs of new building, and the inhabitants of every city must become interested and expressive in bringing about the necessary ideals and procedures to rebuild our cities in terms of human comfort and happiness.

Europe at Play

Europe at Play, A Study of Recreation and Leisure Time Activities.—By L. H. Weir. A. S. Barnes & Co. New York. 1937. *xvi* + 589 *pp.* $10.00 from THE AMERICAN CITY.

Mr. Weir has made a preliminary study of post-war recreation organization, its facilities and activities in the various countries. The motivating forces, the setting and the outstanding manifestations of these activities are presented in a well-balanced manner. The chapter headings are: "Factors and Motives in the Recreational Movement in Europe"; "General Town Planning as Related to Recreation Activities, Areas and Facilities"; "Transportation and Recreation"; "Allotment and Small Garden Movement"; "Forests and Recreation"; "Nature Instruction, Facilities and Activities"; "Cultural Use of Leisure"; "The Youth Hostel Movement and Youth Hostels"; and "Special Leisure-Time Organizations." The volume is finely illustrated and contains a complete index.

Machine Control of Budget

Budgetary Control Through Modernized Mechanical Methods—A Discussion of Forms, Account Classification and Statistical Reports. Published by Burroughs Adding Machine Co., Detroit, Mich. 36 pages with forms and photographs. Free upon application.

The day of the lump-sum budget has, of course, passed. The modern method is to "encumber" the various accounts of a department as fast as goods are ordered and paid for. The significant figure is not how much was appropriated, but how much remains available.

In setting up a budget the tendency is to safeguard it through commitments. If these commitments are charged against the proper budget account of a department, the balance remaining is the unencumbered account, and the prompt knowledge of what this is enables the comptroller or other finance officers to prevent the awarding of purchase orders or contracts in excess of this amount. This system makes it possible to avoid having to reject a payment because of over-spending. By knowing whether or not an order ought to be placed, the financial affairs of the municipality are controlled within the financial department of the municipality, and a certain amount of embarrassment is avoided. This efficient situation is the result of having detailed information, which merely requires one or more budget-accounting machines, depending upon the size of the municipality.

This type of machine is remarkable in that it provides five balances in one operation on each budgeted account. It prints these balances without any copying work done by the operator. The system is simple. When the purchase order is written, a copy is made for the comptroller. He segregates these copies by departments.

The first record consists of a Report of Orders Placed. This form (about 14 x 22 inches) is inserted in the carriage of the machine. The first or original copy is perforated so that that part of the form which is a confirmation of the order may be torn out and sent to the purchase department for its record. This report is made up daily, every few days, or weekly, again in accordance with the size or buying-activity of the municipality, and is obtained as a by-product of posting to the budget ledger accounts.

The second record is the Purchase Orders Liquidated and Expenditure Journal, which shows all the transactions which raise or lower the balance of any budget account. Here, for example, is the automotive servicing account of the police department, for which $2,000 has been appropriated. This Journal shows at a glance outstanding orders not yet paid amounting to $45.74, orders paid for amounting to $180.35, an unexpended balance of $1,819.65, and an unencumbered balance of $1,773.91 against which new commitments can be placed.

The third record is the Summary Report, which is a monthly exhibit of the workings of the budget.

Refrigeration

"Sections of the Revised Chicago Code of 1931 Relating to Refrigeration with Amendments up to and Including December 29, 1937," is available in mimeographed form, including an index. 28 pp. 25c. (Apply to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

Uniform Building Code

The 1937 edition of "Uniform Building Code" was prepared, as were earlier editions, by a large number of cities in cooperation with practically every national technical, research and trade organization, and governmental bureau in the United States interested in the problem. It is a practical code, founded on nationally known and up-to-date building practices, and is easily adopted by local ordinance. 352 pp. $1.00. (Apply to the Pacific Coast Building Officials' Conference, 124 W. Fourth St., Los Angeles, Calif.) (See also p. 83 of this issue.)

American School and University

The American School and University, 1938.—*Published by the American School Publishing Corporation, 470 Fourth Ave., New York.* 659 *pp.* $2.50.

This is the tenth annual edition of "A Yearbook Devoted to the Design, Construction, Equipment, Utilization, and Maintenance of Educational Buildings and Grounds." If advancement can be measured in terms of equipment, the American school is no laggard. Each year the number of new designs for buildings and for all sorts of study helps and conveniences seems to increase in geometrical progression. In keeping up with these new developments, The American School and University is an indispensable guide. It contains 19 editorial sections, including lists of the heads of educational institutions throughout the country, architects of school buildings, and aids available to local school boards from state departments. The section headings covering the numerous informative articles are: "The Building Program"; 'Design and Construction of Buildings"; "Operation and Maintenance"; "Landscape Design and Development"; "Physical Education and Athletics"; "Classroom — Library — Auditorium"; "Commercial Department—Administrative Office"; "Cafeteria—Home Economics—Dormitory"; "Laboratory Design and Equipment"; "Shop Planning and Equipment"; and "Transportation Service." The volume contains cumulative indexes of subjects and places and authors, covering the 10 editions which have appeared to date, a classified index to manufacturers' products and services, and an index to advertisers.

Films for Traffic Safety

"Films for Traffic Safety" is the title of an interesting address by Dwight McCracken on a rather new subject. He analyzes the possibilities of this medium for educating the people to traffic safety. He shows that the subject matter of a sound film is more easily retained than a lecture, that films can reach farther geographically, and that they catch the interest of more disinterested people. Activities undertaken so far in this field are outlined. 6 pp. (Apply to Dwight McCracken, Secretary, Motion Picture Traffic Safety Committee, 175 Berkeley St., Boston, Mass.)

School Lighting Standards

A particularly valuable publication sponsored by the Illuminating Engineering Society and the American Institute of Architects and approved by the American Standards Association is "American Recommended Practice of School Lighting." It is the result of the cooperative efforts of those who build schools and the specialists in vision with particular relation to its use in the schools. All kinds of lighting for all kinds of weather for all kinds of student activities are analyzed. 60 pp. 25c. (Apply to the Illuminating Engineering Society, 51 Madison Ave., New York.)

Cedar Rapids Water System

"The Cedar Rapids City Water Supply System" is a brief description of the way in which water service is furnished to the public of Cedar Rapids. Prefaced by a short historical sketch, the administration, the technical processes and the capital investment and business volume of the water works are analyzed. 17 pp. (Apply to the City Water Works, Cedar Rapids, Iowa.)

Cleveland's Public Utilities

The Department of Public Utilities of Cleveland, Ohio, has published a pamphlet entitled "Cleveland's Municipally Owned Public Utilities," for the purpose of acquainting the public with the scope and size of this large citizen-owned industry. The activities and equipment of the Division of Water and Heat, the Division of Light and Power, and the Division of Sewage Disposal are described and profusely illustrated. 31 pp. (Apply to the Dept. of Public Utilities, Cleveland, Ohio.)

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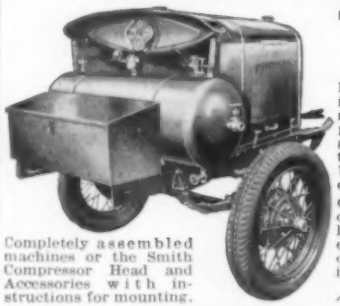

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During April we hope you will remember to mention THE AMERICAN CITY.

Premature Subdivision

Premature Subdivision and Its Consequences.—By Philip H. Cornick. Published by the Institute of Public Administration, 302 E. 35th St., New York. 1938. xxi + 346 pp. $1.00 in paper; $1.50 cloth bound.

The plan for this study was originated by the late Robert Whitten, who was the administrative head of New York State's planning activities. After his death in June, 1936, it was carried out by Mr. Cornick, who was the first to be officially consulted on the project, with the help of an advisory committee and the funds of the Institute of Public Administration. The finished report is described in a subtitle as "A Study Made for the State Planning Council of New York of the Premature Subdivision for Urban Purposes of Outlying Lands in Selected Metropolitan Areas of New York State." The first chapter describes some of the early subdivision booms and their consequences, and the second provides telltale figures and illustrations of the extent of premature subdivision reached in several large cities and their surrounding counties, including New York City. Chapters III and IV portray premature subdivision in its relation to arrears of taxes and cost of government. The fifth chapter covers the important connection of land use and premature subdivision, and the sixth contains a series of maps showing the locations of premature subdivisions. The final three chapters deal with subdivision control, under the police power and through limitations on grants of power; the cure of existing blight and the prevention of future blight. (See also p. 91.)

Refuse Incinerators

THE AMERICAN CITY has obtained the privilege of reprinting a series of papers on "Incinerators for Garbage and Refuse Disposal" which were presented before the Sanitation Group of the American Society of Mechanical Engineers, January 5, 1938, and which are also being published in installments in the monthly issues of THE AMERICAN CITY. The first two articles are of the same title as the symposium and are by H. S. Hersey and Alden E. Stilson. The third article is entitled "The Consulting Engineer's Work on Incinerator Projects" and is by Harrison P. Eddy, Jr. This symposium presents practical information on incinerators and their use which should be of value to the department concerned with refuse disposal in any city. 16 pp. 25c. (Apply to THE AMERICAN CITY, 470 Fourth Ave., New York.)

Buckingham: Housing Laboratory

A most significant development in the housing progress of the country is the building of Buckingham by the Committee for Economic and Social Progress, Inc., under the inspiration of the late Allie S. Freed. It is a demonstration of large-scale housing without subsidy for middle income families. Its purpose is to show the economies and improved quality made possible by large-scale operation. *The Architectural Record* has recently published and reprinted an article entitled "Buckingham: Housing Laboratory," by Oscar Fisher. It describes and illustrates in some detail this project and its significance to the home production industry. (Apply to *The Architectural Record*, 119 W. 40th St., New York.)

The Problem of Makeshift Homes

There are three types of slum: the shack type which grows at the edges of cities, by railroads, polluted waters and dumps; the run-down area; and the built-in, speculative, tenement slum. The first type has perhaps received the least amount of attention from the cities because of its scattered nature, but, nevertheless, the shanty town is a great social menace, and each new shack blights the area in which it appears. A publication entitled "The Municipal Problem of Makeshift Homes, A Preliminary Study of the Wisconsin Situation," by Arthur J. Rabuck, is a specialized discussion of the shack and shanty town. Because of the widespread occurrence of this phenomenon, such a study should be of considerable interest to cities all over the country. 27 pp. 50c. (Apply to the League of Wisconsin Municipalities, 30 E. Johnson St., Madison, Wis.)

The Tax Law

The *New York State Tax Bulletin* for July, 1937, is a complete presentation of "The Tax Law as it Relates to the Assessment and Taxation of Real Property, 1937." 108 pp. (Apply to the Dept. of Taxation and Finance, State Office Bldg., Albany, N. Y.)

Burning Question

Burning Question.—By Louis Wallis. Willett Clark & Co., Chicago and New York. 1937. x + 111 pp. 75c.

Under our present system of taxation we encourage speculation in land by imposing a relatively small tax upon it, and we discourage building and other industry by taxing them heavily. The resulting difficulty is particularly noticeable in the production of decent dwellings, where the cost is pushed up to an inordinate degree by the inflated value of the ground upon which they must be built, combined with the burden of taxation upon the structures themselves. If taxation were shifted from the buildings to the land values, land prices would necessarily be forced down and construction would be stimulated, and the whole building industry would benefit as well as the consumer. All other capital enterprises would feel the same relief, for government tax receipts would come out of the community-created land values and not from struggling industry.

State Fiscal Policies

Over a period of 4½ months, a special joint legislative committee has been studying the fiscal procedure and policies of New York State in the hope that some changes might increase efficiency and bring about certain economies. The published "Report of the Joint Legislative Committee on State Fiscal Policies" which has recently appeared is not the final word on all the state's fiscal problems, but it considers in detail those which seemed of first importance. The financing of relief and the budgetary procedure are two topics receiving special attention. Other chapters deal with The Fiscal Year and the Year-End Surplus or Deficit, State Funds, Capital Outlays, Public Borrowing by the State, Public Borrowing by Localities, Highways, Housing, and Taxation. In some instances definite conclusions and recommendations are made, whereas in others additional study is proposed. 275 pp. (Apply to the New York State Legislature, Albany, N. Y.)

The Streams of Champaign County

The Regional Planning Commission of Champaign County, Ill., has recently made a study of the small waters of the county and published a report entitled "Planning the Network of Our Streams." The study is largely composed of statements from 30 citizens who have been connected in some way with the problem. The various observations made show the relation of the county streams to the daily life of its inhabitants, and the conclusions point to the need for comprehensive planning to prevent pollution and erosion and to provide better drainage, and establish the proper relation between water utilization and conservation, and between the streams and roads and recreation. 46 pp. (Apply to the Regional Planning Commission of Champaign County, Urbana, Ill.)

Highway Accidents

The Bureau of Public Roads of the United States Department of Agriculture has made a report to Congress recommending measures to reduce the highway accident toll. The report is based on extensive field studies and falls into six parts, which are published under the following titles: "Nonuniformity of State Motor-Vehicle Laws"; "Skilled Investigation at the Scene of the Accident Needed to Develop Causes"; "Inadequacy of State Motor-Vehicle Accident Reporting"; "Official Inspection of Vehicles"; "Case Histories of Fatal Highway Accidents"; and "The Accident-Prone Driver." 114, 32, 27, 5, 76, and 52 pp., respectively. Part I is 15c and the others 10c each. (Apply to the Supt. of Documents, Washington, D. C.)

Facing the Housing Problem

"Facing the Housing Problem," by Clarence Senior, is a brief presentation of the housing problem with particular reference to Milwaukee, published by the recently-formed Milwaukee Housing Council. It describes the housing shortage, the way in which Milwaukee's slum dwellers live, the advantages of subsidizing new housing rather than a costly slum, the income and cost dilemma, and, finally, methods of housing the people and the cost involved. 24 pp. 10c. (Apply to the Milwaukee Housing Council, Mariner Tower, Milwaukee, Wis.)

The Public Assistance Worker

The Public Assistance Worker.—Edited by Russell H. Kurtz. Published by the Russell Sage Foundation, New York. 1938. 224 pp. $1.00 *from* THE AMERICAN CITY.

This volume is concerned with the various ways in which public aid can be given, emphasizing the need for more attention to the individual needs of families as against the routine methods of providing assistance. The chapters of this volume are entitled: "Public Assistance in the United States"; "Who Shall Be Granted Public Aid? How Much? In What Form?"; "Dealing with People in Need"; "Problems of Health and Medical Care"; "Tying in with the Community"; and "Public Assistance and Social Work." An excellent reading list on the subject is included.

The Cincinnati Waterfront

The City Planning Commission of Cincinnati has published a special report on "The Cincinnati Waterfront, Its Problems and Recommended Future Utilization." A number of improvements are suggested expressly for flood control and protection, since the flood of January, 1937, proved that extreme high water may completely paralyze the economic and social life of the city. The construction of a number of flood walls and levees, the building of some elevated streets, and the total evacuation of certain areas for dwelling purposes are some of the recommendations. 25 pp. (Apply to the City Planning Commission, Cincinnati, Ohio.)

Radio Operators' Manual

The Radio Department of the General Electric Company has published the second edition of its "Radio Operators' Manual." It is in three parts. The first part contains general information on radio systems used by police, fire and conservation departments and public utilities, and analyzes different types of equipment. Part II is concerned with the Federal Communications Commission, its set-up and the procedures through which it authorizes station licenses. Part III contains questions and answers for the aid of those wishing to take Federal examinations for radiotelephone operator licenses, first, second and third class, or for a third class radiotelegraph operator's license. 181 pp. $1.00. (Apply to General Electric Co., Radio Dept., Schenectady, N. Y.)

Government Survey

A report on "The Governments of Atlanta and Fulton County, Georgia" has been recently made by the Consultant Service of the National Municipal League, of which Thomas H. Reed is director. 161 + 619 pp. $5.00. (Apply to the Chamber of Commerce, Atlanta, Ga.) (A review of this work appears on page 73 of this issue.)

Civil Service Guide

The Civil Service Assembly has published a valuable and authoritative guide to the merit system agencies in this country, entitled "Civil Service Agencies in the United States—A 1937 Census." The legal basis and organizational structure of each agency which has been set up since the first law in 1883 is described. The Assembly intends to bring the census up to date from time to time, and welcomes news on the establishment of any new agencies. 55 pp. (Apply to the Civil Service Assembly, 1313 E. 60th St., Chicago, Ill.)

Other Reports Received

DETROIT, MICH.—Annual Report, Civil Service Commission, year ended December 31, 1937.

DETROIT, MICH.—Annual Report, City Plan Commission, 1937. 20 pp.

FAIRFIELD COUNTY, CONN.—"Profits From Planning," February, 1938. Business Men's Number. Published by the Fairfield County Planning Association. 7 pp.

FREDERICKSBURG, VA.—Annual Report, 1937. 61 pp.

HARRISBURG, PA.—"A Program for Harrisburg's Future." Published by the Chamber of Commerce.

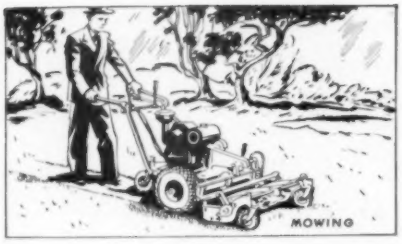
JAMESTOWN, N. Y.—Annual Report, Municipal Electric and Water Systems, 1937. 37 pp.

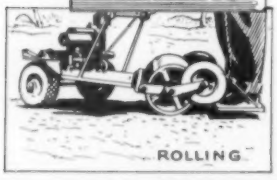
LYNCHBURG, VA.—Annual Report, 1937. 47 pp.

MANSFIELD, MASS.—Annual Report, 1937. 143 pp.

SAN DIEGO, CALIF.—"San Diego Affairs 1936-37." 50 pp.

WINCHESTER, VA.—Report for 1935-1936-1937. 32 pp.





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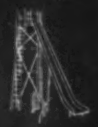
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Conventions -- When and Where

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

Meeting is annual convention unless otherwise designated

APRIL 7-8.—LAFAYETTE, IND.
American Water Works Association — Indiana Section. (Purdue Union Bldg.) Sec., J. A. Bruhn, Box 855, Indianapolis, Ind.

APRIL 11-12.—WASHINGTON, D. C.
Conference of State and Territorial Health Officers of the United States Public Health Service. (Public Health Service Auditorium.) Address: Dr. Thomas Parran, Jr., Surgeon General, Treasury Dept., Washington, D. C.

APRIL 19-22.—NEW ORLEANS, LA.
The American Institute of Architects. (Roosevelt Hotel.) Exec. Sec., E. C. Kemper, 1741 New York Ave., Washington, D. C.

APRIL 20-23.—JACKSONVILLE, FLA.
American Society of Civil Engineers. Spring meeting. Sec., George T. Seabury, 33 W. 39th St., New York.

APRIL 20-22.—ST. LOUIS, MO.
Missouri Association of Public Utilities. (Jefferson Hotel.) Asst. Sec., Jesse Blythe, 101 W. High St., Jefferson City, Mo.

APRIL 24-28.—NEW ORLEANS, LA.
American Water Works Association. (Roosevelt Hotel.) Sec., Harry E. Jordan, 29 W. 39th St., New York.

MAY 2-5.—WASHINGTON, D. C.
Chamber of Commerce of the United States. Sec., D. A. Skinner, 1615 H St., N. W., Washington, D. C.

MAY 5-7.—OLD POINT COMFORT, VA.
American Forestry Association. (Chamberlin Hotel.) Exec. Sec., Ovid Butler, 919 17th St., N. W., Washington, D. C.

MAY 5-6.—COLUMBIA, MO.
Missouri Association of Mayors and Other Municipal Officials. (Hotel Tiger.) Exec. Sec., George A. Spencer, 412 Guitar Bldg., Columbia, Mo.

MAY 9-10.—MACON, MO.
Missouri Association of Municipal Utilities. (Jefferson Hotel.) Sec.-Treas., W. J. McCarroll, Fulton, Mo.

MAY 9-12.—ATLANTIC CITY, N. J.
National Fire Protection Association. (Haddon Hall.) M'ng Dir., Franklin H. Wentworth, 60 Batterymarch St., Boston, Mass.

MAY 9.—DANBURY, CONN.
New England Sewage Works Association. (Hotel Green.) Sec., F. W. Gilcreas, State Dept. of Health, Albany, N. Y.

MAY 11-14.—NORRIS PARK, TENN.
National Conference on State Parks. Exec. Sec., Miss Harlean James, 901 Union Trust Bldg., Washington, D. C.

MAY 13-14.—BOZEMAN, MONT.
American Water Works Association — Montana Section. (Baxter Hotel.) Sec., Herbert B. Foote, State Dept. of Health, Helena, Mont.

MAY 17-19.—CHICAGO, ILL.
Midwest Safety Conference. Mgr., George C. Traver, 222 N. Bank Drive, Chicago, Ill.

MAY 18-21.—WILKES-BARRE, PA.
Pennsylvania State Association of Township Commissioners. (Sterling Hotel.) Sec.-Treas., H. A. Fritschman, Eagle and Darby Roads, Upper Darby, Pa.

MAY 19-21.—SPOKANE, WASH.
American Water Works Association — Pacific Northwest Section. (Davenport Hotel.) Sec., Fred Merryfield, Oregon State College, Corvallis, Ore.

MAY 19-20.—BALTIMORE, MD.
Maryland-Delaware Water and Sewerage Association. (Emerson Hotel.) Sec., A. W. Blohm, 2411 N. Charles St., Baltimore, Md.

MAY 23-25.—DAYTONA BEACH, FLA.
American Water Works Association — Florida Section. Sec., J. R. Hoy, 404 Hildebrandt Bldg., Jacksonville, Fla.

MAY 23-26.—ST. LOUIS, MO.
National Association of Purchasing Agents. (Hotel Jefferson.) Sec.-Treas., G. A. Renard, 11 Park Pl., New York.

MAY 24-27.—NASHVILLE, TENN.
Smoke Prevention Association. (Andrew Jackson Hotel.) Sec., Frank A. Chambers, 1411 City Hall Square Bldg., Chicago, Ill.

MAY 25.—RIDGEWOOD, N. J.
American Water Works Association—New Jersey Section. Sec.-Treas., H. N. Lendall, College of Engineering, Rutgers Univ., New Brunswick, N. J.

MAY 26-28.—ROCK ISLAND, ILL.
National County Officers' Association. (Armory.) Pres., George F. Breitbach, Court House, Milwaukee, Wis.

JUNE 3-4.—BUFFALO, N. Y.
New York State Sewage Works Association. (Hotel Lafayette.) Sec.-Treas., A. S. Bedell, State Dept. of Health, Albany, N. Y.

JUNE 7-9.—ATLANTIC CITY, N. J.
Edison Electric Institute. M'ng Dir., Bernard F. Weadock, 420 Lexington Ave., New York.

JUNE 7-9.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. (College Buildings.) Sec.-Treas., I. M. Glace, 22 S. 22d St., Harrisburg, Pa.

JUNE 8-10.—ELMIRA, N. Y.
Conference of Mayors and Other Municipal Officials of the State of New York. (Mark Twain Hotel.) Exec. Sec., William P. Capes, City Hall, Albany, N. Y.

JUNE 8-10.—STATE COLLEGE, PA.
Pennsylvania Sewage Works Association. (College Hotel-Nittany Lion.) Sec., L. D. Matter, Kirby Health Center, Wilkes-Barre, Pa.

JUNE 13-18.—KANSAS CITY, MO.
American Library Association. (Municipal Auditorium.) Sec., Carl H. Milam, 520 N. Michigan Ave., Chicago, Ill.

JUNE 13-17.—LOS ANGELES, CALIF.
Institute of Government. (Univ. of Southern California.) Address: Emery E. Olson, Dean, School of Government, 3551 University Ave., Los Angeles, Calif.

JUNE 16-18.—BALTIMORE, MD.
Eastern Association of Fire Chiefs. (Lord Baltimore Hotel.) Sec., Charles E. Clark, Box 217, Wayne, Pa.

JUNE 20-24.—WASHINGTON, D. C.
American Institute of Electrical Engineers. (Mayflower Hotel.) Nat'l Sec., H. H. Henline, 33 W. 39th St., New York.

JUNE 20-22.—MINNEAPOLIS, MINN.
National Conference on Planning. (Nicollet Hotel.) Joint annual conference of American Planning and Civic Association, American Society of Planning Officials and American City Planning Institute. Exec. Dir., Walter H. Blucher, American Society of Planning Officials, 850 E. 58th St., Chicago, Ill.

JUNE 20-22.—ERIE, PA.
Pennsylvania State Association of Boroughs. Pres., Thomas F. Chrostwaite, Hanover, Pa.

JUNE 21-23.—BURLINGTON, VT.
New England Association of Fire Chiefs. (Hotel Vermont.) Sec., John W. O'Hearn, Watertown, Mass.

JUNE 26 - JULY 2.—SEATTLE, WASH.
Joint meeting. (Olympic Hotel.) *American Public Welfare Association.* Dir., Fred K. Hoehler, 850 E. 58th St., Chicago, Ill. *National Conference of Social Work.* Gen. Sec., Howard R. Knight, 82 N. High St., Columbus, Ohio.

JUNE 26-30.—NEW YORK CITY.
National Education Association of the United States. (Pennsylvania Hotel.) Sec., Willard E. Givens, 1201 16th St., N. W., Washington, D. C.

JULY 18-22.—DALLAS, TEXAS.
Southwestern Chamber of Commerce School. (Baker Hotel.) Sec., H. W. Stanley, Chamber of Commerce, Dallas, Texas.

JULY 24-29.—STANFORD UNIVERSITY, CALIF.
Western Conference for Commercial and Trade Executives. (Lagunita Court.) Business Mgr., Leonard E. Read, 433 California St., San Francisco, Calif.

JULY 25-28.—ALLENTOWN, PA.
Pennsylvania Chiefs of Police Association. Sec., F. B. Titus, Lansdowne, Pa.

AUGUST 13-20.—MEXICO CITY.
International Federation for Housing and Town Planning. Congress. Gen. Sec., Donald C. L. Murray, rue Cantersteen 47, Shell Bldg. 608, Brussels, Belgium. Mexican rep., Carlos Contreras, Ramos Arizpe No. 1, Mexico, D. F.

AUGUST 14-20.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. (Northwestern Univ.) Sec., C. R. Miles, 836 First Nat'l Bank Bldg., Chicago.

AUGUST 29 - SEPTEMBER 1.—MINNEAPOLIS, MINN.
Illuminating Engineering Society. (Nicollet Hotel.) Gen. Sec., A. D. Cameron, 51 Madison Ave., New York.

AUGUST 29 - SEPTEMBER 3.—ATLANTA, GA.
International Association of Fire Fighters. (Atlanta Biltmore Hotel.) Sec.-Treas., George T. Richardson, A. F. of L. Bldg., Washington, D. C.

SEPTEMBER 7-10.—PRINCETON, N. J.
Governmental Research Association. (Princeton Inn.) Sec.-Treas., Robert M. Paige, 850 E. 58th St., Chicago, Ill.

SEPTEMBER 12-15.—BALTIMORE, MD.
International Municipal Signal Association, Inc. (Lord Baltimore Hotel.) Sec., Irvin Shulsinger, 7 E. 42d St., New York.

SEPTEMBER 13-16.—BOSTON, MASS.
New England Water Works Association. (Hotel Statler.) Sec., Frank J. Gifford, 613 Statler Bldg., Boston, Mass.

SEPTEMBER 18-22.—MILWAUKEE, WIS.
American Institute of Park Executives. Exec. Sec., Will O. Doolittle, Box 422, Tulsa, Okla.

SEPTEMBER 19-22.—ATLANTIC CITY, N. J.
American Transit Association. (Atlantic City Auditorium.) Gen. Sec., Guy C. Hecker, 292 Madison Ave., New York.

SEPTEMBER 19-22.—SANTA BARBARA, CALIF.
League of California Municipalities. Sec., Richard Graves, City Hall, San Francisco, Calif.

OCTOBER 3-5.—NEW YORK CITY.
American Public Works Association. Exec. Dir., Frank W. Herring, 850 E. 58th St., Chicago, Ill.

OCTOBER 3-7.—PITTSBURGH, PA.
National Recreation Association. (William Penn Hotel.) Administrative Sec., Thomas E. Rivers, 315 Fourth Ave., New York.

OCTOBER 6-7.—WASHINGTON, D. C.
American Water Works Association—Four States Section. Sec.-Treas., Carl A. Hechmer, Washington Suburban Sanitary District, Hyattsville, Md.

OCTOBER 6-8.—HARTFORD, CONN.
Joint meeting. (Hotel Bond.) *New England Sewage Works Association.* Sec., F. W. Gilcreas, State Dept. of Health, Albany, N. Y. *New York State Sewage Works Association.* Sec.-Treas., A. S. Bedell, State Dept. of Health, Albany, N. Y.

OCTOBER 10-14.—CHICAGO, ILL.
National Safety Council. (Stevens Hotel.) M'ng Dir., W. H. Cameron, 20 N. Wacker Drive, Chicago, Ill.

OCTOBER 13-15.—DES MOINES, IOWA.
American Water Works Association—Missouri Valley Section. Sec., Earl L. Waterman, Univ. of Iowa, Iowa City, Iowa.

OCTOBER 13-14.—MADISON, WIS.
League of Wisconsin Municipalities. Sec., Frederick MacMillin, 30 E. Johnson St., Madison, Wis.

OCTOBER 17-20.—OKLAHOMA CITY, OKLA.
American Water Works Association—Southwest Section. (Biltmore Hotel.) Sec.-Treas., Lewis A. Quigley, 3320 W. Berry St., Fort Worth, Texas.

OCTOBER 25-28.—KANSAS CITY, MO.
American Public Health Association. Exec. Sec., Dr. R. M. Atwater, 50 W. 50th St., New York.

OCTOBER 25-28.—KANSAS CITY, MO.
Conference of State Sanitary Engineers. Sec.-Treas., R. E. Tarbett, United States Public Health Service, Washington, D. C.

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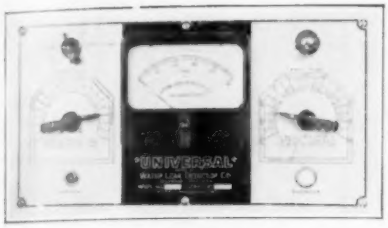

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Improved Detector for Water Leaks

A new 1938 converter type of water-leak survey equipment and pipe locators has been announced by the manufacturers of the "Universal" Super-Power instrument. This converter model is designed particularly for water-leak surveys, enabling water-works engineers to detect small leaks at considerable distances and under pavements. Tests have shown that it will locate, within a few minutes, ten-to fifteen-year-old leaks heretofore impossible to find.

Among the improvements interesting to note are the following: the B battery pack, previously used by operators of "Universal" equipment, is now replaced by an automatic converter, insuring a constant flow of B current at the required maximum voltage; a form of visual amplitude recording, called the "measured sound method," eliminates mistakes caused by the failings of the human ear, and, having located the leak, determines its approximate size in advance of excavation. A new filter construction in this 1938 model reduces traffic noise interference to the minimum, and a new panel of aluminite, with black and red letters, makes for easy reading at night. New type square cable plugs are used.

Those interested in modernizing city water departments may write to the Universal Water Leak Detector Co., 155 North 3rd Street, Columbus, Ohio, for its new catalog entitled "The Universal Method of Water Leak Survey."

Worthington Pumps for Detroit Storm Water

A contract for the sixth duplicate 84-inch vertical-shaft, single-suction, screw-type centrifugal pump for the city of Detroit Conners Creek Storm-Water Pumping Station has been awarded to Worthington Pump and Machinery Corporation, Harrison, N. J. Originally designed to include eight pumps, the Conners Creek Station was put into operation in 1930 with four units, the fifth being added in 1935.

This station primarily serves a low flat area of about 2,733 acres, a considerable part of which is below the level of high water in the Detroit River. In addition, the low flows from the Fox Creek district of the city are carried to this station through a 14-foot relief sewer, which comprises an ultimate area of 14,733 acres. With the installation of this sixth unit, the total installed capacity will approximate 2,000,000,000 gallons per day.

Convention Fares to New Orleans Reduced

John S. Warde, Chairman of the Transportation Committee, Water Works Manufacturers Association, Inc., has announced that there has been a $7 reduction in the fares on the special train of the Pennsylvania Railroad which is to take delegates to the convention from New York, Philadelphia, Harrisburg, Pittsburgh, Cincinnati, Louisville and Birmingham.

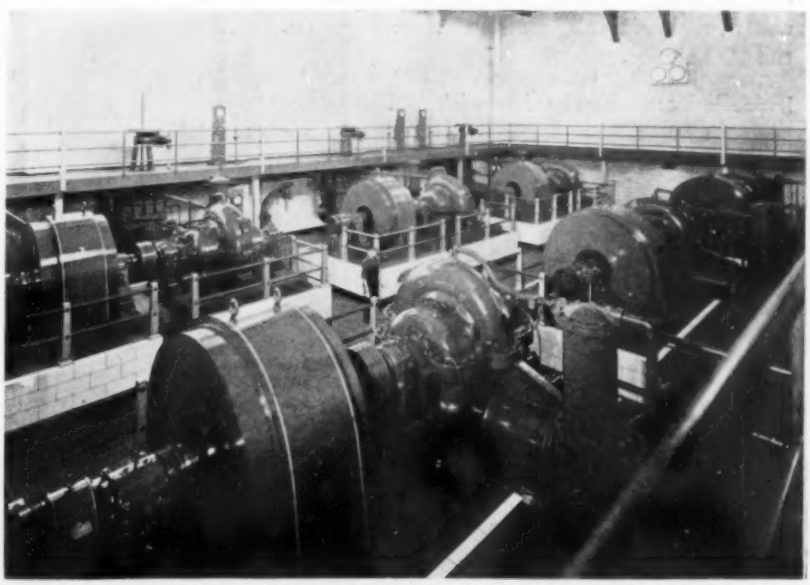
The Birmingham Chamber of Commerce has invited the A.W.W.A. delegates to spend the day, Saturday, April 23, in Birmingham and be their guests, and they are furnishing motor transportation in private automobiles for transfers and sightseeing, luncheon at the Birmingham Country Club and dinner at the Tutwiler Hotel. The charges for other features of the tour, with Pullman fares in chartered sleeping cars to New Orleans, are very reasonable from all sections of the country.

Complete information may be secured from John S. Warde, Chairman, Transportation Committee, 50 Church Street, New York.

Linings for Tanks for Ferric Chloride

The increasing use of ferric chloride in sewage-treatment plants has led to the necessity of using more effective protective linings for steel tanks. One of the early installations of protective linings was on the 12,000-gallon tanks at the Dearborn, Mich., sewage-treatment plant. These storage tanks, together with three additional service tanks, were lined in December, 1933, with rubber by Collord, Inc., 7049 Lyndon Avenue, Detroit, Mich., using the S-R-L method by which seams, laps and blistering conditions are eliminated. The rubber used was the finest grade of Latex, compounded in the Collord laboratory to a special formula and applied 3/16-inch thick to all interior surfaces, including pipes, valves and flanges.

After four years of continuous service through winter and summer, the linings of all five tanks are reported by Fredrick R. Storrer, City Engineer of Dearborn, to be in perfect condition. A booklet of facts about S-R-L tanks and how they differ from ordinary rubber-lined tanks may be secured from H. Tom Collord, President, Collord, Inc., Detroit, Mich.



INTERIOR OF THE RECENTLY COMPLETED CERMAK PUMPING STATION, CHICAGO, ILL. The Allis-Chalmers pumps deliver 50 million gallons of water daily against a head of 136 feet and are driven by 1,500-hp, 514-rpm Westinghouse synchronous motors

"Our Addressograph more than paid for itself the first year by reducing loss due to tax 'rejects' alone."

"Among other services, Addressograph fills in triplicate copies of all water bills and lists voters' registration sheets quickly and legibly."

What MUNICIPAL OFFICERS *say about* ADDRESSOGRAPH *Methods*

"Addressograph methods reduced our election expenses as much as 50%... eliminating all mistakes."

"For accuracy, economy and convenience in Street Department control, I recommend Addressograph equipment."

PRACTICALLY all of the necessary routine jobs in Municipal offices include the copying of names or other information on forms, lists, records, reports and receipts.

Where hand methods are used for these jobs, the work becomes a definite burden. Separate hand motions required to copy each character take too much time. Mistakes often occur. Illegible transcriptions are frequent. Loss of citizen good will results, which is perhaps of even more importance than the losses of time and money.

But hundreds of municipalities have eliminated these burdens with Addressograph methods. Addressograph uses a metal typing unit that serves both as the original record and the means by which copies are made on any form. *One motion* copies complete record. Accuracy of every copy is assured, regardless of who does the work because typing unit, once checked, can't make a mistake. Every impression, made from type through a ribbon, is clear and legible. Excellent carbon copies can be made automatically.

ADDRESSOGRAPH METHODS NATIONALLY APPROVED

Municipal officers in hundreds of cities, counties, towns and villages are unanimous in their endorsement of Addressograph methods. Details of how they are using the methods so successfully are well worth your investigation. See phone book for address of nearest Addressograph Sales Agency and request particulars. Our representative will tell you of the benefits Addressograph is providing for other municipalities. If you prefer, write us direct.

Use of Addressograph Methods for Any One of These Jobs Eliminates Burden of Routine Work . . . Provides Protection Against Losses:

TAX OFFICES
Tax duplicates, assessment rolls, delinquent notices. Single or continuous forms.

UTILITY DEPARTMENTS
Water, gas, electric bills. Meter readers' books. Ledger and other forms.

VOTERS' BUREAUS
Voters' registration lists, sample ballots and other forms.

STREET DEPARTMENTS
Garbage collecting, snow removal, forms used for street cleaning control.

PAYROLL DEPARTMENT
All payroll forms such as checks, lists, records, reports and receipts.

STORES DEPARTMENTS
Inventory records, requisitions and reports.

LICENSE BUREAUS
Licenses, application forms, envelope addressing.

RELIEF OFFICES
Relief lists. Food and fuel orders. Other welfare and relief forms.

POLICE DEPARTMENTS
Reports of thefts, notices of criminals, reward bulletins and other distributed forms.

ADDRESSOGRAPH-MULTIGRAPH CORPORATION . . . *Cleveland, Ohio*

ADDRESSOGRAPH-MULTIGRAPH OF CANADA, LIMITED, TORONTO

Sales Agencies in All Principal Cities Throughout the World

Do you mention THE AMERICAN CITY? Please do.

Nichols Acquires Decarie

The Nichols Engineering and Research Corporation, 40 Wall Street, New York, has acquired the Decarie refuse incinerator of the basket type from the Underpinning and Foundation Co. With the addition of this refuse incinerator, Nichols Engineering and Research Corporation now offers a complete line of equipment for the disposal by incineration of all types of municipal refuse.

Messrs. Morris, Woodman, Buffington and Burgess, former engineers of the Decarie Corporation, are now associated with the Nichols Corporation. C. W. Nichols, Sr., Chairman of the Board of Nerco, states that his organization will continue the same effort to provide service to engineers and others interested, both as to projected plants and those already in operation. Sales work will be carried on under the direction of H. J. Hartley, President of Nerco, as at present, with the existing personnel of his corporation, which includes Mark B. Owen, Vice-President.

Equipment Manufacturer Opens New Office

The Globe Phone Manufacturing Corporation, pioneer in the electrical waterworks field, has announced the opening of its new executive offices at 11 West 42nd Street, New York. Globe manufactures precision equipment which includes the Geophone leak locator, Audio type pipe finder, the Magnetic Dipping Needle and the Aqua-Pipe phone.

Manufacturing of these products will be continued at the Reading, Mass., factory, but under the present expansion plans of Globe's President, O. H. Allen, arrangements are being made for the opening of an additional plant in New York City with a view to providing better service to distributors and customers in product engineering and manufacturing. These expansion plans also include the selection of distributor outlets for Globe water-works equipment in all sections of the country.

Quarter Meters for Playgrounds and Recreation Areas

Put a quarter in it—and play tennis or practice golf or have a softball game after nightfall. Sports fans who prefer their recreation after dark can drop a coin into a "prepayment" time switch, and Presto! floodlights illuminate the desired area. The General Electric Co., Schenectady, N. Y., can furnish the timer with suitable gearing to produce the lighting interval desired, thus providing income for the city and recreation for the citizen.

Enlarged Facilities for Westinghouse

Announcement of the early construction of new manufacturing and warehouse facilities at its East Springfield, Mass., works has just been made by the Westinghouse Electric & Manufacturing Co. of East Pittsburgh, Pa. This expansion is planned to take care of anticipated business growth in connection with new types of housing and to accommodate certain manufacturing operations being transferred from the Chicopee Falls (Mass.) works.

The new manufacturing building will have approximately 100,000 square feet of floor space devoted to the manufacture of beverage coolers, water coolers and commercial refrigeration units. Space will also be provided for the manufacture of that part of air-conditioning equipment known as the room cooler type. The new plant will fabricate the sheet metal parts and structural members entering into the manufacture of such cooling units.

The warehouse, two stories in height and planned to include approximately 230,000 square feet of storage space, will be used to store finished products such as are now in Chicopee Falls and Springfield warehouses.

Additional personnel will probably be required, and an expenditure of $1,250,000 has been appropriated, a large portion of which will be used for new machinery of the latest type. Prack & Prack, of Pittsburgh, Pa., are the architects.

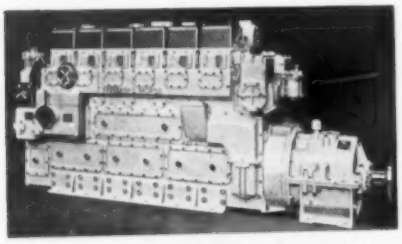
HERCULES
"TIRE PACK"
Dump Body
Carries the SPARE TIRE UNDER THE BODY
Burglar Proof
Dirt Proof
Weather Proof
COMPARTMENT
MAX. 8-25-20
Compartment for Tools Flares Shovels
NOW
PATENTS APPLIED FOR
8 - FT. BODIES CAN BE CARRIED ON SHORT WHEEL BASE TRUCKS-
Without a Tire Mounting Problem!
No longer does valuable pay-load space have to be sacrificed for satisfactory spare tire mounting. Hercules puts the spare under the body — out of the way saving approximately 11 inches between cab and body. Now 8 foot bodies replace 7 foot bodies with perfect load distribution.
Available only with the Hercules Super Power 16-T "Center Lift" Hoist which is designed and built in conjunction with the body underframe.
THE HERCULES WAY
THE CONVENTIONAL WAY
Write for Literature
HERCULES STEEL PRODUCTS CO.
GALION, OHIO, U. S. A.

Convertible Engines Announced by F-M

Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago, Ill., has announced a series of new four-cycle, vertical, convertible diesel and gas engines, Model 36-A-8. To fill the demand for sturdy medium-sized engines in the 200- to 300-hp range, this model has been built in both six- and eight-cylinder combinations, with 8-inch bore and 10½-inch stroke, and can develop 35 hp per cylinder at 720 rpm.

Both diesel and gas engines in the 8-inch cylinder size are offered for stationary service, and the diesels for marine use in complete, unit-built Fairbanks-Morse generating sets as well. These marine service diesels are direct-reversible, but can be furnished as non-reversible where such service requires.

The objectives of the designers have been reliability and economy in service, and the resultant engine is extremely simple and neat in appearance. En bloc construction has been employed, with individual cylinder liners, precision main, connecting-rod and cam-shaft bearings, and suspended or "underslung" crankshaft. As a distinct advantage in certain types of application, the design permits double-end drive or power take-off from either end.



NEW FAIRBANKS-MORSE CONVERTIBLE GAS-DIESEL FOUR-CYCLE ENGINE WHICH DEVELOPS 35-HP PER CYLINDER

Jewell Heads New Section of Westinghouse

The new Industrial Department recently announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to meet the changing conditions in industrial markets, will consist of six industry sections: Metal Working; Mining; Petroleum and Chemical; Public Works and Communications; General Mill; and Marine Electrification.

J. H. Jewell, as Manager, heads the new Public Works and Communications Section. Included in its scope are public works, communications, amusements, and relations with architects and consulting engineers whose major work identifies them with the above industries. Mr. Jewell is a graduate of Pratt Institute, 1920, and since that date has been associated with Westinghouse Sales at headquarters and in the Middle Atlantic District. Since 1928 he has had charge of the construction section at Philadelphia.

THE DUFF-NORTON GEARED PIPE PUSHER

A Geared Pipe Pusher

The Duff-Norton geared pipe pusher is a new pulling or pushing jack designed to force pipe up to 6 inches in diameter horizontally underground. This makes it possible to lay pipe under arterial highways, boulevards, bridge heads and railroad crossings without interrupting traffic.

The Duff-Norton pipe forcing jack No. 725, made by the Duff-Norton Manufacturing Co., 2709 Preble Avenue, Pittsburgh, Pa., differs from other jacks in that pipe can be both pushed and pulled at one setting of the jack. After a small trench 8 x 3 feet is dug at the point of entry and exit, the jack is placed in the trench and securely blocked with heavy timbers and channel irons. A 3-foot section of pipe is screwed to the jack pilot and also coupled to the jack. The pushing operation is then ready to begin.

By simply working the jack handle back and forth, a high pressure is applied, forcing the pipe steadily through the ground. After each section has been pushed its entire length, a new section is added until it emerges at the receiving end.

Large Zeolite Plant Shipment by Boat

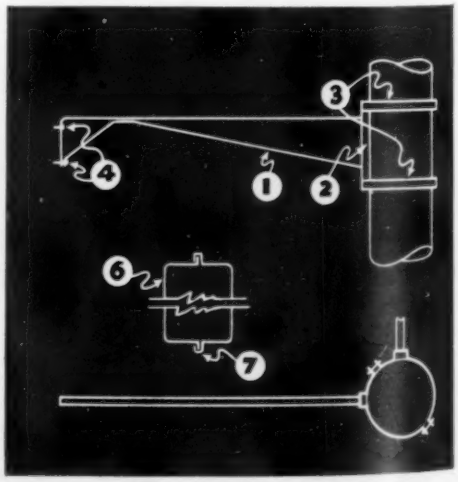
Following the sale to the Ranier Paper Co. for its new Fernandina, Fla., plant of the largest sea-water regenerating zeolite water-softening plant in the world, The Permutit Co., 330 West 42nd Street, New York, chartered a ship to make delivery. The plant consists of specially constructed 14-foot diameter zeolite softeners and 8-foot diameter by 20-foot long filters. It will handle 10,000,000 gallons of water per day, producing a finished process and boiler feed water. It is fully automatic in operation. This is the largest shipment in the history of Permutit.

Erection of Street Signs

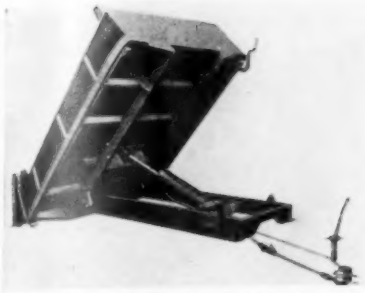
The accompanying phantom plan-view shows the construction of a bracket arm which supports a street sign panel and has a diagonal member for added rigidity. The diagonal compression member (1) gives adequate strength, and the vertical bearing (2) on the post carries the bracket arm as well as the two steel bands (3) which strap the unit to the pole. The entire bracket is hot-galvanized after fabrication to insure against oxidation. At the extreme end of the bracket there are two case-hardened steel cadmium-plated drive bolts (4), over which is passed the aluminum end casting of the street sign, which in turn is locked in place by two 5/16-inch diameter cadmium-plated patented locknuts. The nuts are recessed into the aluminum casting, making it difficult for unauthorized persons to remove them. The small spring locking wire in the nut digs itself into the groove of the thread on the bolt to prevent loss through vibration, in addition to making it more difficult for unauthorized persons to tamper with it maliciously.

The name plate tube (6) is made of 99 per cent pure enameling iron, by hemming and spot welding two channel sections together (7) which, after passing through the porcelain enameling process, makes the tube one homogeneous piece. The porcelain enameling process consists of the application of four coats of porcelain enamel, each fired on at 1600 degrees F. in an electric furnace. An aluminum cushion gasket is provided to give proper bearing for the name plate panel against the pole.

Federal signs are designed for maximum readability, with the color combination of black letters on a yellow field. These reflect better at night because the extreme lemon-yellow color penetrates. All prefixes and suffixes are made in smaller size letters to conserve space for the name proper. Full details may be secured from the Federal Electric Co., Inc., 8700 South State Street, Chicago, Ill., in the form of illustrated bulletins.



METHOD OF ERECTING FEDERAL STREET SIGNS



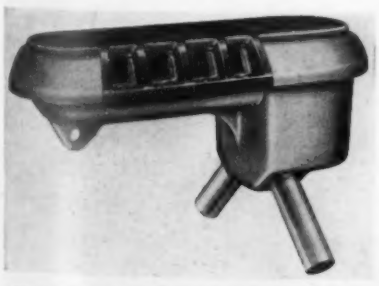
THE 1938 MODEL D6 GAR WOOD DIRECT-LIFT HYDRAULIC HOIST

Re-Designed Hoist of Direct-Lift Type

One of the many new 1938 re-designed Gar Wood units is the Model D6 direct-lift hoist, in which the dumping angle has been increased and the mounting height lowered. The D6 hoist has a 6-inch bore with a 16¾-inch stroke, and is specially designed for Gar Wood Type C bodies. All four sides of the body tailgate are flanged into a box-shape, affording additional strength with less weight. Engineering simplicity is one of the achievements attained in the new line of Gar Wood units, according to the manufacturer, Gar Wood Industries, Inc., Detroit, Mich.

Landing Field Outlines Improved

Engineers have been working diligently to improve the safety of aeroplane landings. Illumination engineers last year made an important contribution in a better runway marker. Improvement in radio landing beams has made unnecessary the outlining of the field by the "picket fence" type of lights. The new marker made by Westinghouse Electric & Manufacturing Co., Cleveland, Ohio, casts a horizontal beam instead of a vertical one. Ninety per cent of the light is held within ten degrees of the horizontal. The unit uses a sodium-vapor lamp which is more efficient and, being monochromatic, penetrates fog better. These units, with all but their elongated button heads buried in the ground, must be able to withstand the full force of a heavy transport plane landing on them. The lens is made of the new practically unbreakable Herculite glass.



THE WESTINGHOUSE SODIUM CONTACT LIGHT FOR AIRPORTS

Concrete Paving Blocks

A new type of paving unit, a granite-faced precast concrete block, manufactured under factory conditions including water-cement ratio specifications and modern methods of vibration and curing, has been placed on the market by the Ultimite Paving Block Corporation of America, 60 East 42nd Street, New York. This block is laid 9 units to the square yard, has but 23 lineal feet of joints per square yard, and has four times greater surface area per unit than other types of unit paving blocks. Because of the accuracy of manufacture and the uniformity of size and shape, the Ultimite block is easily laid to true alignment, giving a smooth, regular surface with a minimum depth of cushion and close, tight joints. The standard block is a gray, light color, but white blocks contrasting with these may be laid to form permanent markers for traffic lanes.

The granite used in the manufacture of Ultimite blocks is the scrap and waste found in abundant quantities in granite quarries. The stone is put through a crusher and then used in its entirety. The dust is used instead of sand, ¾-inch stone as aggregate; and the stone which cannot pass through a 2-inch ring but passes through a 3-inch ring is used for facing and edges. In the manufacture of a block the fragments of granite are placed in the form, the interstices are filled with a fairly dry mixture of grout, and the remainder of the form is filled with concrete. After solidifying by vibration, the blocks are struck off and allowed to cure for about 30 days under uniform conditions.

This unit is 11⅞ inches square and 4 or 5 inches in depth, the weights being approximately 50 pounds for the 4-inch unit and 62 pounds for the 5-inch unit.

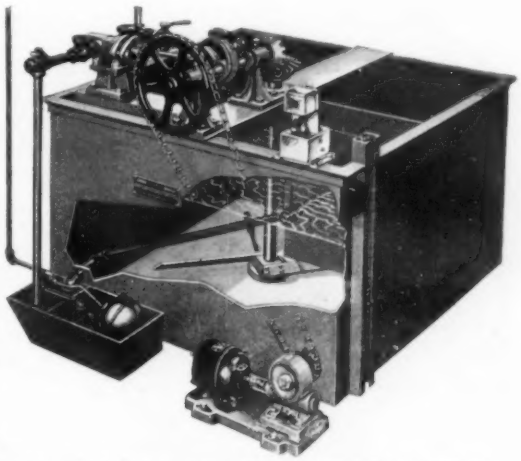
Meredith Joins Western Cataphote

Western Cataphote Corporation, Toledo, Ohio, has announced the appointment of W. H. Meredith, widely-known highway traffic engineer, as special traffic and reflecting sign engineer. He will work with state highway departments throughout the country on safety problems connected with signs and markings, traffic signals, accident-prone locations, and safety educational work.

Mr. Meredith has been with the Missouri State Highway Department for the past 16 years, specializing as engineer of marking in charge of state-wide traffic work during the latter half of this period. He originated a mechanical method of determining safe speeds on curves which was used on US-40 through Missouri last year with notable results. Having made wide use of Cataphote reflector buttons on Missouri roads in the past, his experience will now apply in suggesting their efficient application to road signs throughout the country.

Chemical Solution Feeder for Water Treatment

A chemical solution feeder designed to proportion the quantity of chemical in accordance with the volume of fluid to be treated is manufactured by the American Water Softener Co., Lehigh Avenue and 4th Street, Philadelphia, Pa. The basic unit of this American Electro-Magnetic chemical feeder is the proportioner. This device controls the feed of the chemicals in exact proportion to the flow of water, no matter what that flow may be, as long as it can be measured by a water meter. The meter and its contact box furnish electrical impulses causing the proportioner to lower the take-off pipe in proportion to the rate of flow. As the swiveled pipe is lowered, the chemicals flow off through the unrestricted slotted opening in the pipe to the point where they are applied to the water. On top of the water meter is a mercoid contact box equipped with a mercury switch which prevents any possibility of faulty operation. This furnishes the impulses for the operation of the proportioner.



THE TYPE S.S.A. AMERICAN ELECTRO-MAGNETIC CHEMICAL FEEDER FOR DELIVERING THE CHEMICAL SOLUTION AGAINST PRESSURE

Inasmuch as the proportioner is operated from the water meter, the swivel take-off pipe is lowered in proportion to the flow of water, and the chemical is thus fed through the non-clogging slotted opening to the take-off pipe proportionately. When the flow of water is constant and a constant feed of chemicals is desired, a small synchronous motor contactor is used to furnish constant rate impulses for the operation of the proportioner. This takes the place of the water meter required when treating a variable flow of water. A special type of feeder is used with a small pump when it is necessary to deliver the solution against pressure. This type S.S.A. feeder is shown above.

TO THE RESCUE

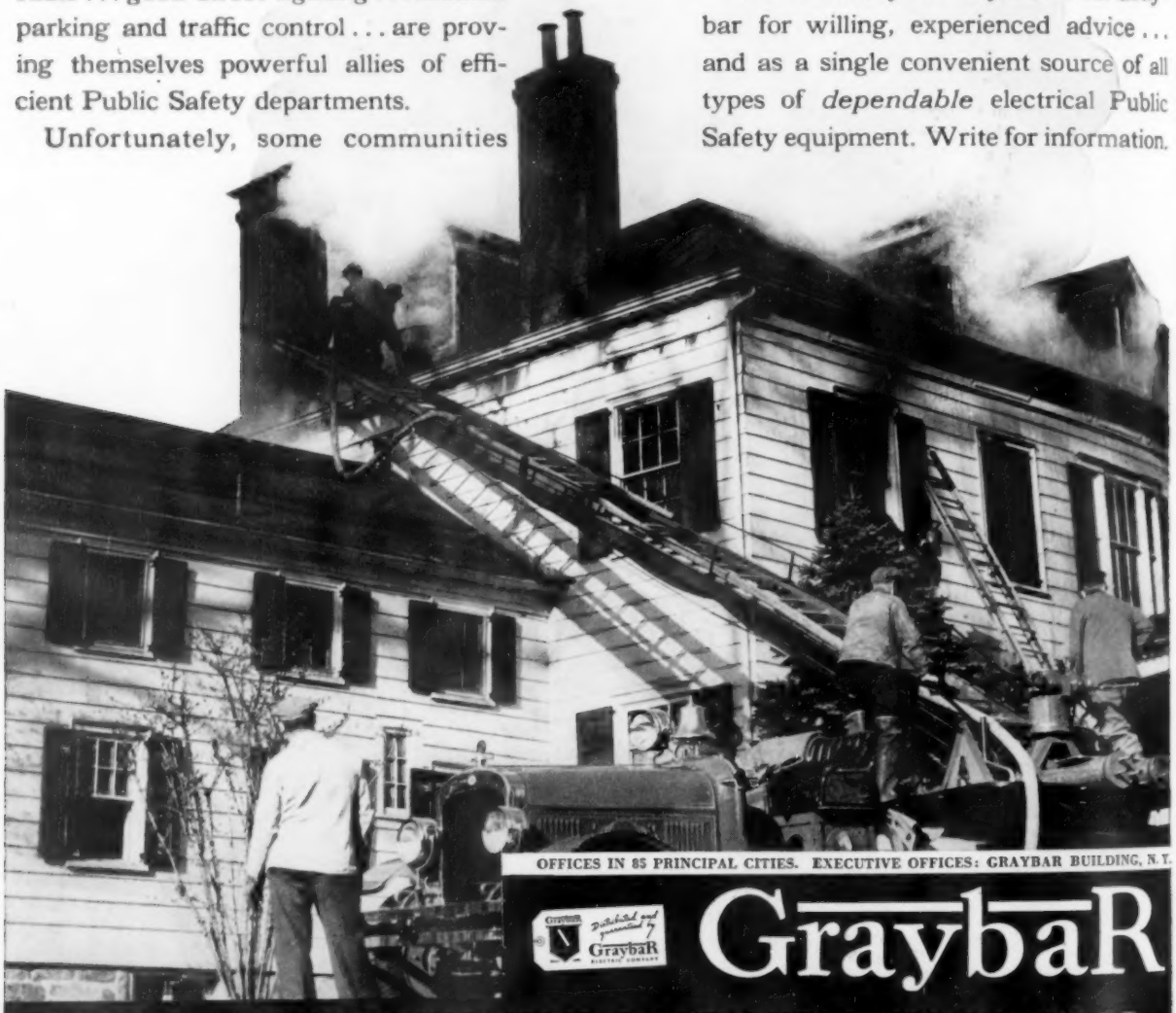
at 186,000 miles per second!

The almost unbelievable speed of electricity has been enrolled in the fight for Public Safety.

Today electric fire-alarms . . . Police radio . . . good street lighting . . . modern parking and traffic control . . . are proving themselves powerful allies of efficient Public Safety departments.

Unfortunately, some communities have not kept up-to-date. Yet the cost of modern Public Safety equipment is only a small fraction of the losses in life and property it would *prevent*.

What about *your* city? Call on Graybar for willing, experienced advice . . . and as a single convenient source of all types of *dependable* electrical Public Safety equipment. Write for information.

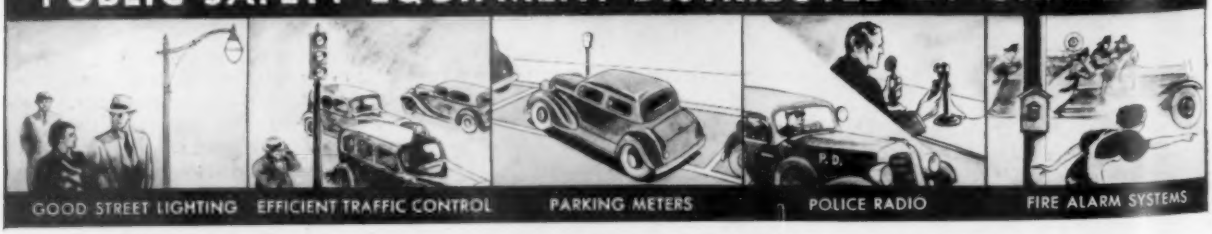


OFFICES IN 85 PRINCIPAL CITIES. EXECUTIVE OFFICES: GRAYBAR BUILDING, N. Y.

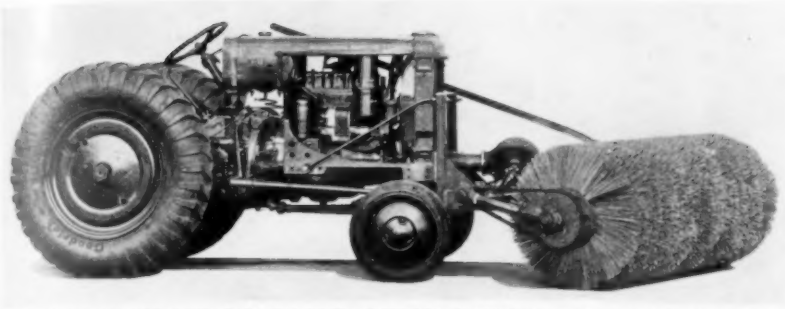
Distributed and guaranteed by GraybaR ELECTRIC COMPANY

GraybaR

PUBLIC SAFETY EQUIPMENT DISTRIBUTED BY GRAYBAR:



GOOD STREET LIGHTING EFFICIENT TRAFFIC CONTROL PARKING METERS POLICE RADIO FIRE ALARM SYSTEMS



THE NEW HOUGH ONE-WAY TRACTOR SWEEPER WITHOUT BRUSH DUST HOOD AND CHAIN GUARDS TO BETTER SHOW CONSTRUCTION

New One-Way Sweeper for Tractor Mounting

A new one-way sweeper engineered to meet the needs of municipalities, parks, cemeteries and large industrial plants in removing snow and dirt from sidewalks and drives has been announced by the Frank G. Hough Co., 919 North Michigan Avenue, Chicago, Ill. The tractor on which the one-way sweeper is mounted is cranked through the front of the crankshaft, thereby leaving the rear power take-off on the tractor available for other work. The brush of this sweeper is fed at 30 degrees to the right of the part being swept. The brush is 30 inches in diameter and 72 inches long, and the whole machine weighs only 600 pounds. Brushes are either Hickorette filled or steel bristle, and Bassine brushes can be supplied.

A snow-plow attachment is available with a blade 16 x 72 inches which mounts ahead of the brush and which is controlled by the same means as the brush lift. The plow is set to clear the ground by about 2 inches. The plow thrusts aside the heavy snow, and the brush sweeps aside the remaining 2 inches.

Asphalt Institute Officers

At the annual meeting of the Board of Directors of The Asphalt Institute, representing three-fourths of the asphalt-producing industry in the United States and Canada, Joseph S. Helm, of the Standard Oil Co. of New Jersey, was elected President for the fiscal year beginning April 1, 1938. B. L. Boye of Socony Vacuum, the retiring president, was made Chairman of the Executive Committee.

Other officers elected were: Vice-Presidents, James A. Blood, of the Standard Oil Co. of California; T. M. Martin, of Lion Oil Refining Co., and A. M. Maxwell, of Standard Oil of Ohio; Treasurer, Herbert Spencer, of Standard Oil of New Jersey; Secretary, F. V. Widger, of The Texas Co. The Executive Committee includes Boye, Blood, Helm, Martin and David Waxman of Shell Petroleum Corporation. J. E. Pennybacker continues as Managing Director of the Institute.

President Helm announced that in spite of the depression the consumption of asphalt during 1937 exceeded that in 1936 by 1 per cent, reaching an all-time high 17 per cent above the 1929 level. This he ascribed largely to the development of the farm-to-market road program, the total mileage of these low-cost all-weather roads now having passed 100,000.

Powdered Carbon Fed by Standard Pump

The well-known Little Red Pump of Proportioneers, Inc., 9 Codding Street, Providence, R. I., which is used in the field extensively for hypo-chlorination and for which standard data sheets have been prepared by the manufacturer, is now being used for measuring and pumping suspensions of activated carbon for treating waters with tastes and odors. A very interesting installation diagram showing how a water supply can be carboned for taste and odor control may be secured direct from Proportioneers. Also, a complete set of charts, which may be used to determine carbon dosage, may be secured from Proportioneers or from the Darco Corporation, 60 East 42nd Street, New York.

New Display Room Announced for Fairbanks-Morse

Fairbanks, Morse & Co. has announced the formal opening of its display room on the first floor of the modernized and renamed Fairbanks-Morse Building at 600 South Michigan Avenue, Chicago, Ill. Dominating the exhibit is a 10-ton, 8-cylinder diesel engine for marine service. Grouped about this are electrical machinery, pumps, scales, railroad and farm equipment, household appliances, automatic coal burners and air conditioners—products that are manufactured in Fairbanks-Morse factories throughout the country and sold throughout the world.

Automatic Signal Purchases Tokheim

The Automatic Signal Corporation, East Norwalk, Conn., has purchased the traffic signal division of the Tokheim Oil Tank and Pump Co., Fort Wayne, Ind. The Automatic Signal Corporation plans to continue the manufacture and sale of Tokheim fixed-time and traffic-actuated equipment, in addition to its own line of Electro-Matic traffic-actuated control systems. All manufacturing will be done at East Norwalk.

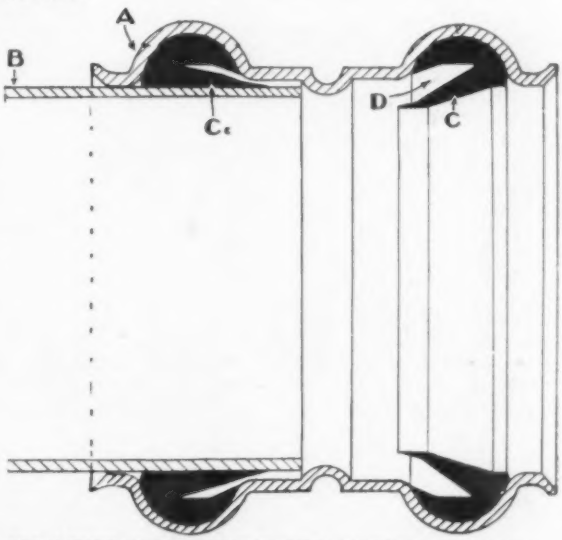
J. N. Paul, formerly in charge of the Tokheim traffic signal division, is now a member of the Automatic Signal Corporation organization.

Threadless Pipe Coupler

A new flexible coupling for plain-end pipe has been announced by the R. H. Pierce Manufacturing Co., Eugene, Ore. The Pierce self-sealing pipe coupler is constructed of a single piece of steel, cold-rolled into shape and containing within itself two cup-gaskets, so placed that the pressure of the water in the pipe seals the joint against leakage at any pressure up to the bursting strength of the pipe.

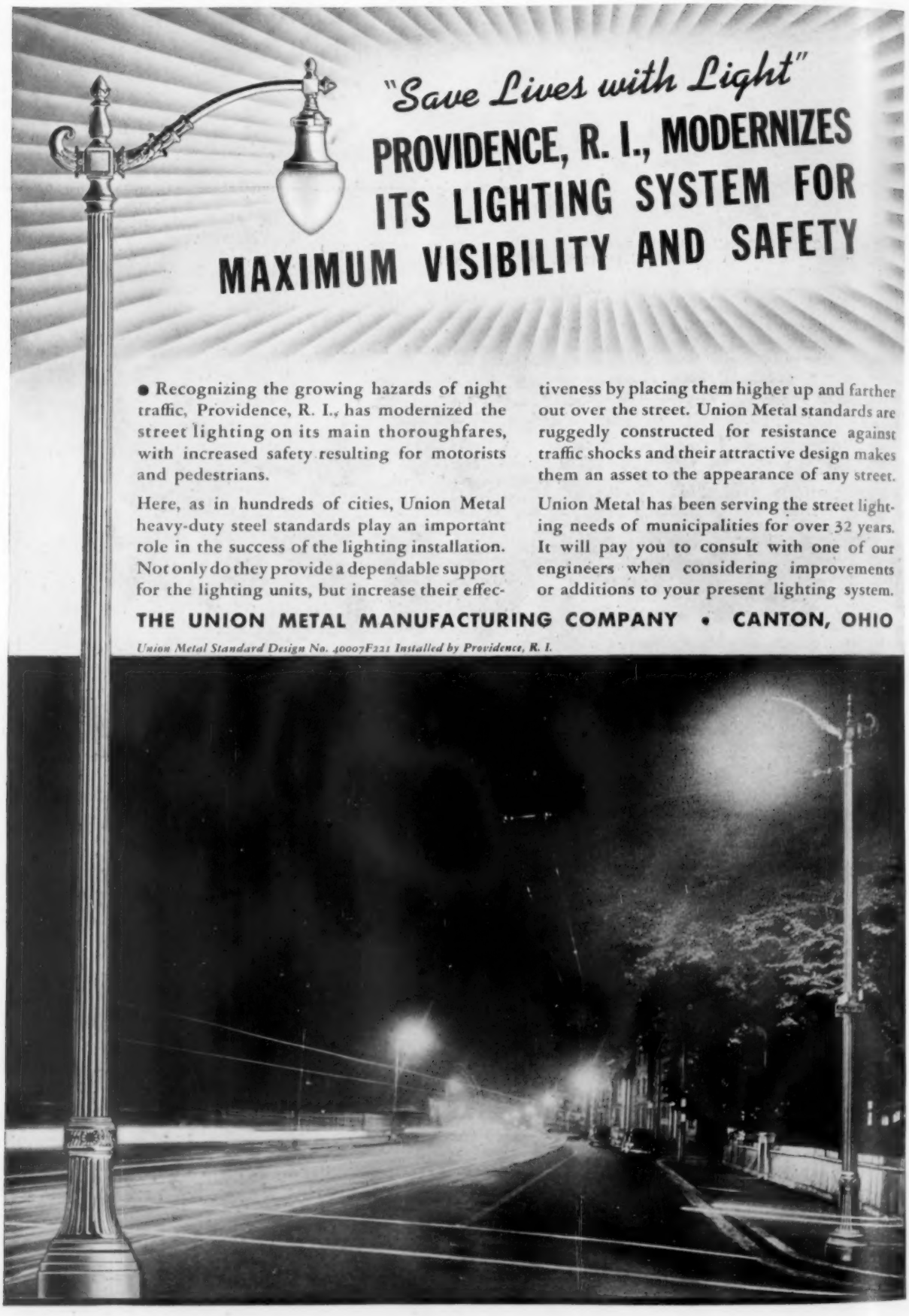
The result is a permanently tight joint which takes care of all expansion and contraction strains and yet is flexible enough to allow pipe lines to conform to variations of alignment. For lines used for water, air, etc., Pierce couplers are equipped with gaskets made of live rubber. For lines used for oil, etc., Neo-Prene synthetic rubber gaskets, which are not affected by oil, are used to form the tight joints.

Sizes from 1 to 20 inches are being produced, to fit standard weight pipe and tubing covering practically all waterworks requirements.



CROSS-SECTION OF A PIERCE PIPE COUPLER WITH ONE PIPE IN PLACE

(A) coupler band; (B) pipe in place; (C) self-sealing gasket in place ready for pipe; (Cc) gasket with pipe in place; (D) cup-shaped groove in gasket



"Save Lives with Light"

PROVIDENCE, R. I., MODERNIZES ITS LIGHTING SYSTEM FOR MAXIMUM VISIBILITY AND SAFETY

● Recognizing the growing hazards of night traffic, Providence, R. I., has modernized the street lighting on its main thoroughfares, with increased safety resulting for motorists and pedestrians.

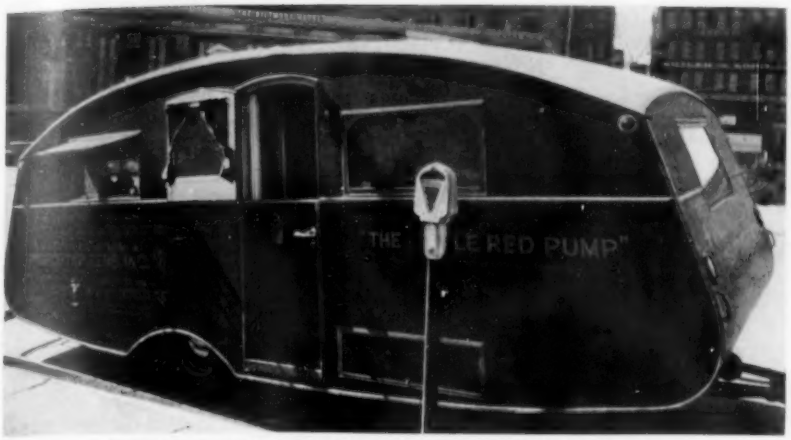
Here, as in hundreds of cities, Union Metal heavy-duty steel standards play an important role in the success of the lighting installation. Not only do they provide a dependable support for the lighting units, but increase their effectiveness by placing them higher up and farther out over the street. Union Metal standards are ruggedly constructed for resistance against traffic shocks and their attractive design makes them an asset to the appearance of any street.

Union Metal has been serving the street lighting needs of municipalities for over 32 years. It will pay you to consult with one of our engineers when considering improvements or additions to your present lighting system.

THE UNION METAL MANUFACTURING COMPANY • CANTON, OHIO

Union Metal Standard Design No. 40007F221 Installed by Providence, R. I.

During April we hope you will remember to mention THE AMERICAN CITY.



THE 1938 EDITION OF PROPORTIONEERS TREATMENT TRAILER

New Treatment Trailer Headed for New Orleans

The 1938 edition of the Proportioneers Treatment Trailer is off for the south. Jeff Corydon, who piloted the 1937 edition for nearly 20,000 miles during eight months of 1937, reports his embarrassment because the 1938 edition is so much longer than the old one that he is continually "broke" on account of having to drop nickels into four parking meters every time he pulls the new unit up to a curb in metered cities. The new trailer, like the old, which unhitched from the car and was wrecked, will serve to carry sanitation department information on methods and machines to the doors of boards of health, water works, sewage plants, swimming pools, canners, dairies, consulting engineers and others wishing first-hand information on hypo-chlorination and general chemical feeding. The Treatment Trailer contains an operating exhibit of various machines and methods for proportioning, including full scale size equipment, which at any time in emergencies can be removed from the Trailer and installed for plants requiring instant service.

During 1938 the Treatment Trailer will be piloted alternately by Henry Armbrust and Jeff Corydon throughout various states, one of the first major destinations being the A.W.W.A. convention at New Orleans during the last week of April. Inquiries regarding the Trailer should be addressed to Proportioneers, Inc., 9 Codding Street, Providence, R. I.

A Detector Valve for Fire Lines

It is generally recognized that the introduction of sprinklers is an effective answer to the tremendous waste of water formerly used in extinguishing fires, since statistics record that during the past ten years more than 40 per cent of all fires in sprinklered risks have been handled by one sprinkler, a ½-inch water flow, and more than 75 per cent of these fires by five or fewer sprinklers, which is the equivalent of one effective hose stream.

Water departments usually require a measuring device on fire-service connections to detect whether the service has been used for any purpose other than for fire. Where there is no draft for domestic purposes, the amount of water registered does not justify the cost of installing and maintaining a full-size meter. Many localities utilize a simple form of detector meter, consisting of a weighted check-valve with a small meter in a by-pass around the check sufficient in size and accuracy to register the quantity of water taken at relatively small rates of flow from such systems.

Globe detector checks, made by the Globe Automatic Sprinkler Co., Philadelphia, Pa., provide accurate measuring for 15, 25 and 40 gpm on 1-, 1½- and 2-inch meters, respectively. Water enters the inlet side of the check-valve, and as the main passage is closed by the weighted swing check, it passes through the metered by-pass. If the flow of water is not large enough to cause a pressure difference sufficient to overcome the difference in pressure between the outlet and the inlet sides, owing to the weighted clapper, the water flows through the meter and is registered. When the flow demand exceeds a given rate, the weighted check-valve opens and only a portion of the water then taken passes through the meter and is recorded.

The valve body of the Globe detector check is made of cast iron and is similar in form and size to that of an ordinary swing check-valve with flanged ends. The clapper is a circular bronze member secured to a bronze arm supported by a bronze hinge pin in the valve body, and has bearings formed in it which receive a bronze hinge pin on which the bronze and lead counterweight is supported. The counterweight leverage is of such design that the dead weight is effective on the clapper only when it is in the closed position, and the effective load decreases with the opening of the clapper; and when the clapper is in the wide-open position the load carried is only the total weight of the parts. The device effectively checks a back flow of water.

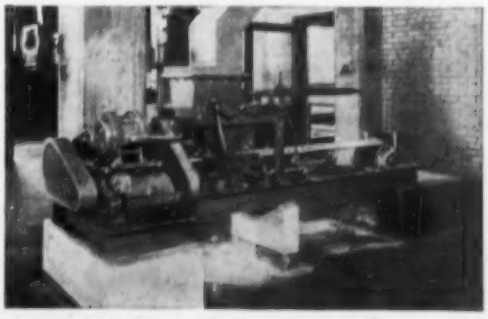
Meet Us at New Orleans
A. W. W. A. Convention
April 25-28, 1938

Weighing Chemicals for Water Treatment

The Schaffer Poidometer for weighing chemicals for water-works treatment is a self-contained unit mounted on a substantial steel channel frame with a beam scale graduated in pounds or kilograms which can be set at whatever amount of material may be required per foot of belt travel. The gate is then adjusted to suit this weight, and the machine delivers the predetermined amount of material with an accuracy which the manufacturer states to be 99 per cent.

This unit, made by the Schaffer Poidometer Co., 2828 Smallman Street, Pittsburgh, Pa., when supplied with a motor for driving the belt through a set of sprockets and a strand of roller chain, is equipped with an automatic control gate and push-button so that when the material in the Poidometer hopper recedes below the bottom of the automatic control gate, a lever on the control gate shaft depresses the push-button which operates the automatic switch, thus stopping the motor and Poidometer belt. When the material is again supplied, it moves the automatic control gate in the hopper which raises the lever from the push-button, thus automatically starting the motor and the Poidometer belt. The recording device, known as the Productimeter, which is also standard equipment on all Poidometers, records the number of feet the Poidometer belt has traveled, and this figure, multiplied by the weight shown on the scale beam, which is equal to the amount of material on each foot of belt, enables the operator to ascertain the exact amount of material handled in any given unit of time.

These dry feed machines are used for weighing and feeding lime, activated carbon, granulated alum, copperas and ferric sulphate in numerous water purification and sewage-treatment plants. They are manufactured in various sizes, varying in capacity from 50 pounds per hour with the 6-inch Poidometer on finely ground material to 250 tons per hour on material ranging in size up to 4-inch cubes with the 48-inch Poidometer.



A SCHAFFER POIDOMETER INSTALLATION AT THE WATER FILTRATION PLANT, MINNEAPOLIS, MINN.

"...It Was A Dark Street..."

". . . the street was so dark I couldn't see until too late." Over and over again these words are forming part of the testimony at inquests and in lawsuits resulting from night auto accidents. Not only accidents, but crime statistics too, in every large city point an accusing finger at the costliness and danger of dark, poorly lighted streets.

L-M STREET LIGHTING MAKES SAFE STREETS

Safe for the driver, safe for the pedestrian, unsafe for the criminal . . . that is the kind of street lighting L-M equipment offers you. Note the clear visibility on the typical L-M lighted street in the photo at the left. By daylight L-M Standards and Luminaires add ornamental distinction to any street's appearance. An L-M illuminating engineer will gladly study your street or highway lighting problem and recommend the right equipment for your particular needs. Write to Line Material Co., South Milwaukee, Wisconsin, for full street lighting information.

LINE MATERIAL CO.

Outdoor Lighting

A Section of The American City
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Ten Years of Progress in Lighting Pottsville's Streets

By CLAUDE A. LORD
Mayor, Pottsville, Pa.

THE city of Pottsville believes that good street lighting is a public necessity and that cities that are lighted according to modern practice attract more and better business. Experience has proved that well-lighted streets also reduce crime and accidents and increase the value of real estate.

In 1927 a street-lighting installation was made in the business section of Pottsville using ornamental twin-light standards, each lighting unit equipped with a 600-cp lamp enclosed in attractive alabaster rippled glassware. This installation provided a model lighting system for a city the size of Pottsville at the time it was completed.

Increased pedestrian and vehicular traffic raised the problem of increasing the street lighting in the business section of the city, so that all the street area in the business district would be adequately lighted according to present street-lighting-code recommendations.

Pottsville therefore modernized its business-district lighting at the expiration of a ten-year contract in 1937. The entire business district was relighted with single-light pendant-type luminaires. The present standards were reconditioned and the light center raised. Each lighting unit was equipped with a 1,500-cp lamp throughout the center of the business district and a 1,000-cp lamp in the outlying sections of the business district. The new luminaires redirect a considerable amount of the upward light onto the street surface through the use of Alzak aluminum deflectors inside the luminaire. The offices above the first story of the buildings in the business section of the city have been shielded from the direct glare of the street lamps.

Ten years of street lighting progress is an index of community growth. Life and property are more adequately protected and traffic problems simplified by increasing the amount of light on the street. The merchants benefit through attracting more prospective buyers to the vicinity of their stores. The new street-lighting system adds to the beauty of the community.

The 1937 photograph of the business district shows the uniform, high-intensity street lighting obtained with the new installation, resulting in increased visibility of both pedestrian and vehicular traffic. Illuminating engineers who have seen the new installation have said that it is one of the finest street-lighting jobs placed in operation throughout the United States.

1937

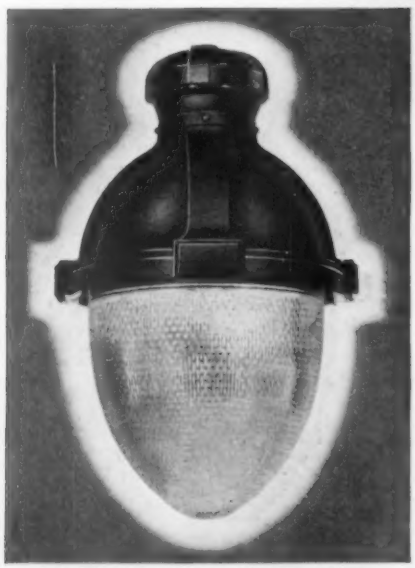
1927

These two bona fide photographs show the business district of Pottsville, Pa., as now, and in 1927. Many changes have taken place in the ten years. "The Hurricane" is showing in the picture house, whereas it was "A Tailor-Made Made" a decade ago. Stream-lined cars, not T models and their contemporaries, now park on the main street. The former 600-cp lamps have been replaced by 1,500-cp pendants as part of a modern system furnished by General Electric and installed by the Pennsylvania Power and Light Co.

AFTER SAVING LIVES WITH LIGHT

DETROIT ORDERS 850 MORE *Westinghouse Reflectolux*

Reflectolux Sr. Luminaires provide complete night driving safety on this Detroit thoroughfare because automobile drivers are able to see dangers ahead in time to avoid them. Test blocks on the street illustrate how hazards stand out for the driver in sharp silhouette in contrast to the surface brightness of the pavement beyond.



The Westinghouse Reflectolux Sr. that has proved so successful in reducing night fatalities in Detroit. This unit is designed for lamps up to 750 watts or 15,000 lumens.

Detroit's achievement in reducing night traffic fatalities has proved that increased visibility for the automobile driver is an absolute necessity. After a year's successful experience with newly-designed street lighting units that provide adequate visibility, Detroit now orders 850 more Westinghouse Reflectolux Sr. Luminaires for an expanded program of nighttime safety.

Detroit's street lighting modernization is based on one of the most thorough traffic surveys in the country. And wherever the new luminaires have been installed, the rate of night traffic deaths has been lowered. Detroit has adopted in Reflectolux a wholly new concept of light utilization that provides a sheen of brightness on the street surface so that pedestrians or other hazards stand out clearly in silhouette to the automobile driver.

The Westinghouse Reflectolux Luminaire provides night visibility conditions comparable with daylight. Reflectolux has a combination of new features — more light on the street surface — less glare — less maintenance — unexcelled flexibility and durability — that make it a leader in any campaign to save lives in night traffic.

For complete details on Reflectolux, ask your local Westinghouse Lighting Specialist for the new book, SAFETY WITH LIGHT; or address Westinghouse Electric & Manufacturing Co., Lighting Division, Edgewater Park, Cleveland, O.

WHEN YOU THINK OF *Lighting Equipment* THINK OF

Westinghouse

Accident Record Shows Need For Better Lighting

Gruver Finds Most Of Crashes In Borough Occur At Night

Council Went To Greenwich Yesterday To Study Sodium Systems

Nearly 60 percent of all accidents occurring along Highway 24 in the borough of Madison in the past three years have occurred at night, in spite of the fact that only one quarter as much traffic moves at night. Two thirds of the injuries resulting from these accidents occurred in the night crashes and of the four persons killed in the borough in those three years, three died at night.

These figures, compiled by a representative of the state safety department after detailed study of Madison police reports, are cited by Mayor Samuel A. Gruver as graphic evidence of the need for an improved lighting system along highway 24 through the borough, a move which he recommended New Year's day when he took office.

That some improved lighting system will be installed this year the council members are certain but

MANY NEWSPAPERS SEE THE NEED

State Aid for New Jersey Towns

MUNICIPALITIES throughout New Jersey are being financially assisted in the lighting of overcrowded and abnormally hazardous state highways within municipal boundaries. Seventy-four communities have been granted state aid since last December, and 3,600 units are being installed to light 140 miles of highway.

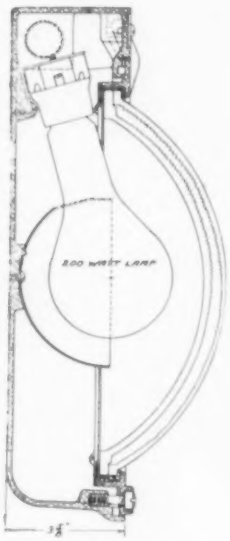
Six thousand-lumen lamps burning in modern equipment are recommended at a spacing of 200 feet, staggered, and at a mounting height of 25 feet above the roadway. These lighting units must be mounted on overhanging brackets to the satisfaction of the state highway engineers. The state's share represents the equivalent cost of a 250-candlepower lamp on a minimum of 200-foot spacings between lamps, when the road is not more than 50 feet wide.

State Highway Commissioner E. D. Sterner believes that "the municipalities should provide lighting at least on a par with the lights they furnish on other streets of equal importance, in return for the local taxes collected. This is particularly true where there is improved real estate fronting on a state highway."

The clipping at the left shows consciousness of unsatisfactory conditions.

For Tunnels and Underpasses

A unit for tunnel and underpass lighting has been designed by Holophane Co., Inc., New York, to direct the "upward" light from the lamp down onto the road surface, and make it uniform when the spacing is not more than four times the mounting height. The unit consists of a compound hemispherical "Refractolens," the two parts ground and sealed together so that the prisms are within the sealed chamber. The housing is cast aluminum. A small spherical reflector is used back of a 200-watt lamp.



Servicing New York's Street Lamps

MAINTENANCE of New York City lighting equipment is the largest job of its kind in the world. There are 25 different types of units, though standardization is proceeding on Form 79E or the acorn type of luminaire. It is a 24-hour job, all lamps in the system being covered by 75 lamping trucks equipped with Murray Crowsnest ladders on a revolving tripod reaching as high as 33 feet from the street.

The men call in each hour to a central office station, which receives all telephone complaints. There are from 400 to 600 complaints every night. Each man covers a district which includes some 4,000 lamps.

MODERN LAMPING TRUCK

Welsbach Street Lighting Co. of America covers about half the greater city, while Broadway Maintenance Corporation covers the other half. The first-named company services the lamps in the boroughs of Manhattan and The Bronx, and at the Rockaways. The other company takes care of the units in Brooklyn, Queens, and Richmond boroughs.

Outdoor Sports at Night

AN INVESTMENT OF $6,000 TO $11,000, DEPENDING ON TYPES OF TOWNS AND LABOR COSTS, AND INCLUDING 100 G. E. NOVALUX FLOODLIGHTING PROJECTORS, WILL LIGHT A FIELD OF 128,000 SQUARE FEET

Owned by a city, such a field has many uses, for pageants, shows, meetings, concerts and sports

Twice as Many Deaths

TRAFFIC accidents ride on the wings of darkness, when there is the least traffic on the street. Danger begins when the sun goes down.

As the chart for Pittsburgh accidents indicates, after 6 P.M. and until breakfast, at a time when but 28 per cent of the day's traffic is using the streets, 50 per cent of all accidents and 65 per cent of all deaths occur. For the after-midnight period alone, the comparison is even more out of balance—5 per cent of traffic, 17 per cent of accidents and 22 per cent of deaths.

In relation to total accidents, the most dangerous single hour is between 5 and 6 P.M. Hours between then and 10 P.M. are in order of accident severity. There are three times as many accidents during the 5 to 6 period of the evening, as there are during the 8 to 9 A.M. period.

DONALD M. MCNEIL,
Traffic Engineer, Department of Public Safety, Pittsburgh, Pa.

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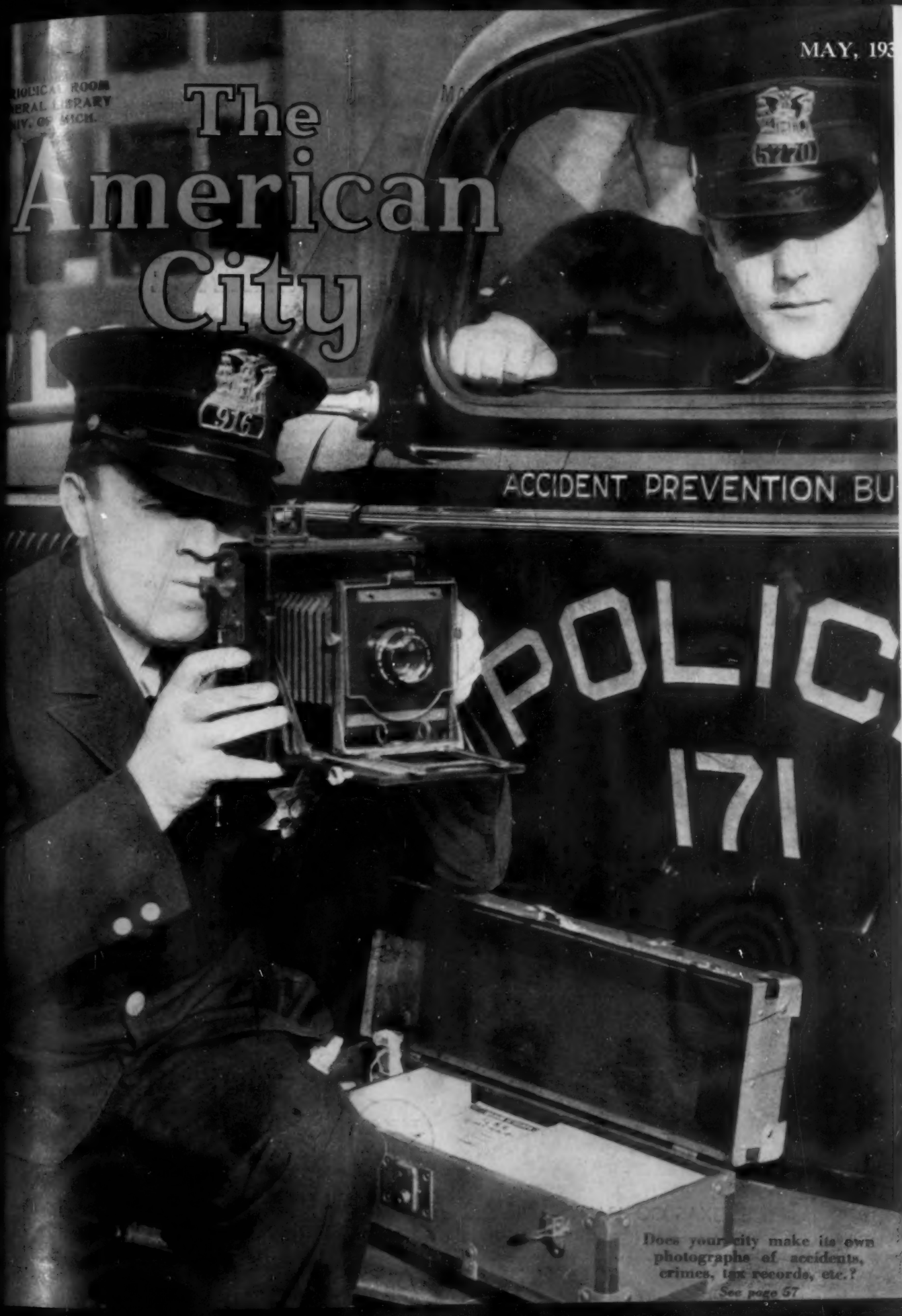
The American City



Does your city make its own photographs of accidents, crimes, tax records, etc.?

See page 57